



**FISH AND WILDLIFE MANAGEMENT
REPORT**

**PROVINCE OF ONTARIO
DEPARTMENT OF LANDS AND FORESTS
Division of Fish and Wildlife**

(These reports are for Intra-Departmental Information and Not For Publication)

**Hon. J. W. Spooner
Minister**

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June, 1960

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INFORMATION AND NOT FOR PUBLICATION)

WOODLAND CARIBOU PROJECT - JULY, 1959

by
D. W. Simkin

Abstract

The present provincial estimate of Woodland Caribou numbers of between 10,000 and 12,000 was believed to be far short of the estimated minimum carrying capacity of 70,000 caribou for the Province. A factor other than winter food was apparently limiting their numbers. In order to learn something of the biology of the caribou a preliminary summer study was made in the former Woodland Caribou Crown Game Preserve from July 2 to July 27, 1959. This involved a study of the summer food habits, sex and age ratios, behaviour, calf mortality and range quality. Woody and herbaceous vegetation constituted a large proportion of the summer food with aspen, birch and pin cherry being the most important. Sub-climax ground lichens were utilized extensively by caribou during the summer. Tree lichens were also used when available. Twenty-one caribou were observed during the study and no group consisted of more than five animals. Islands were thought to play a role in the protection of caribou calves from predators. Caribou are quite amphibious and often take to the water as a means of escape. Estimated speed when swimming was five-six m.p.h. Eight of 14 sexed adults were stags. At least four of six does observed had calves and no sign of calf mortality was observed.

Introduction

Woodland caribou, Rangifer caribou, have undergone a serious decline in Ontario as a whole during the last three or four decades and no factual information has been collected which can conclusively explain why. It was believed that there was a possibility that a deficient supply of winter food might be the answer. To solve this problem Teuvo Ahti, a very competent Finnish lichenologist, was hired in 1957 to survey the caribou range in Ontario and to evaluate it in terms of caribou carrying capacity.

Mr. Ahti was quite impressed by the abundance of ground and tree lichens (presumed to be the principal items in the winter diet of caribou) in most of the area he covered and estimated a minimum carrying capacity of 70,000 caribou for the Province. Since the present provincial estimate of woodland caribou numbers 10,000 to 12,000 something other than abundance of winter food is apparently limiting their numbers.

It was decided that a summer study of caribou should be instigated to add to our meagre knowledge of their biology and to indicate along what lines an intensive study into the limiting factors should be made.

The former Woodland Caribou Crown Game Preserve, located in the Western Rock Region (Ahti's lichen classification) of the Province was selected as the site for the 1959 study.

The writer, assisted by two very capable Indians who trapped in the study area, worked in this area from July 2 to July 27. A conservation officer from Sioux Lookout, E. H. Stone, also assisted for the last 10 days.

Purpose

The main objective of the study was to obtain data on the summer food habits of caribou in the Western Rock Region. Incidental to this, data were to be collected on caribou sex and age ratios, behaviour, calf mortality and range quality.

Methods

To get a comprehensive coverage of the study area it was necessary to move to different locations each day. Base camps were established at Haggart Lake and Irregular Lake from July 2 to 18. Daily and overnight trips were taken from these camps to cover as much of the habitat as possible. On July 18 the writer and Mr. Stone each accompanied by an Indian embarked on two separate five day canoe trips, one to the south and east of the base camp at Irregular Lake, and the other to the east-north-east. These trips took both parties from the heart of the mature jack pine - black spruce coniferous forest with their accompanying excellent stands of ground and tree lichens into the peripheral fire-caused, sub-climax forests which marked the south and east boundaries of caribou summer distribution in this study area. Upon completion of these trips the two parties travelled by canoe to Red Lake thus covering the north-east portion of the lichen forest and penetrating into the sub-marginal lichen-scarce forest to the north and east of the main area of caribou occupation.

Using a helicopter on July 10 and 11, the writer flew transects at two mile intervals over the 320 square mile block constituting the main study area. The chief purpose of this was to determine how much use was being made of bogs by caribou.

Because it was suspected that caribou make extensive use of islands in early summer, especially at calving time, an effort was made to investigate as many islands as possible for evidence of caribou useage and possible signs of calf mortality. Various locations on the mainland also were investigated these being both highland and bog areas. Notes were made on availability and utilization of lichens, woody and herbaceous species. Any evidence of caribou activity was recorded.

Whenever caribou were observed, notes were made on sex, age, location and behaviour of each individual or group. Originally it was thought that long term observations on single caribou or groups of caribou using binoculars and a telescope would be possible; however, due to the fact that the animals were constantly on the move and consequently hard to observe this part of the project was not very successful.

Results

1. Food Habits

A total of 78 different locations were examined. Fifty-two of these were islands and 26 were on the mainland. Ten of the mainland areas were located in bogs.

Table I lists all species observed to have been utilized and the frequency of utilization in the three types.

As can be seen in this table, woody and herbaceous vegetation were extensively eaten during the summer. (In the case of woody species usually only leaves were browsed.) Lichens, as suspected, also constituted a fair proportion of the caribou menu.

Aspen, birch and pin cherry, all of which are very common throughout the study area in forest openings, are apparently the woody species most frequently used.

TABLE I - Species Utilized By Caribou

(a) <u>Herbaceous and Woody Vegetation</u>	<u>Number of Plots Where Species Utilized</u>			
	<u>Bog</u>	<u>Highland</u>	<u>Island</u>	<u>Total</u>
Aspen - <u>Populus tremuloides</u>	1	4	11	16
Birch - <u>Betula papyrifera</u>	1	2	14	17
Pin Cherry - <u>Prunus pensylvanica</u>	1	3	8	12
Mt. Alder - <u>Alnus crispa</u>	2	2	2	6
Mt. Ash - <u>Sorbus sp.</u>	-	-	2	2
Juneberry - <u>Amelanchier sp.</u>	-	1	4	5
Willow - <u>Salix sp.</u>	-	3	3	6
<u>Aralia racemosa</u>	-	-	2	2
<u>Aralia hispida</u>	-	-	2	2
<u>Ribes sp.</u>	-	1	3	4
Raspberry - <u>Rubus sp.</u>	-	-	2	2
Wild Rose - <u>Rosa sp.</u>	-	-	1	1
Bush honeysuckle - <u>Diervilla lonicera</u>	1	1	-	2
Red Osier Dogwood - <u>Cornus stolonifera</u>	-	-	1	1
Horsetail - <u>Equisetum sp.</u>	-	-	1	1
Loosestrife - <u>Lysimachia terrestris</u>	-	1	-	1
Fireweed - <u>Epilobium angustifolium</u>	-	1	-	1
TOTALS	6	19	56	81

(b)	Lichens	Number of Plots Where Species Utilized			
		Bog	Highland	Island	Total
Ground lichens		-	2	7	9
<u>Cladonia mitis</u>		-	2	5	7
<u>C. uncialis</u>		-	2	6	8
<u>C. rangiferina</u>		-	2	5	7
<u>C. gracilis</u>		-	-	1	1
<u>C. crispola</u>		-	-	1	1
<u>Cetraria sp.</u>		-	-	1	1
Tree lichens		-	-	2	2
<u>Evernia mesomorpha</u>		-	-	5	5
<u>Usnea comosa</u>		-	-	4	4
<u>U. cavernosa</u>		-	-	1	1
<u>U. spp.</u>		-	-	1	1
TOTALS		-	8	39	47

Lichens apparently figure quite prominently in the summer diet also. In many instances, however, it was difficult to determine whether lichens had been grazed or trampled. I believe that as the leafy vegetation approaches maturity the role of lichens in the diet decreases. No doubt in the spring and early summer before leaves are formed, lichens must be the most important item in the diet.

Among the ground lichens, three species, Cladonia mitis, C. uncialis, and C. rangiferina are most important as food. In very few areas was the climax lichen C. alpestris present in any quantity whatsoever. This of course indicates that the ground lichens of this area are still in the sub-climax of lichen succession.

Several of the islands and some of the mainland study areas had stands of lichens which were almost eliminated, due, probably, to both over-grazing and trampling. It is my feeling that caribou, during the hot dry summer months when lichens are dry and brittle, probably destroy as much lichen by trampling and trailing as they do by feeding during other times of the year. In this manner moose could be considered competitors with caribou for food as most of the study area is inhabited by moose also.

In certain areas tree lichens are important items in the summer diet of caribou, Evernia mesomorpha and Usnea comosa apparently being the two most important species. Actually most of the good stands of tree lichens are unavailable to caribou, due to their height above ground, however, it appears that enough dead lichen-clad branches fall throughout the area to provide caribou with a substantial supply of this type of food.

TABLE II - Summary of Lichen Sample Plots

- 5 -

	Plot Number	I	II	III	IV	V	VI
% Over-story	Black Spruce	1	6	30	-	30	30
	Jack Pine	-	-	-	6	-	-
	Black Spruce - Jack Pine	-	-	-	-	-	-
% Under-story	Black Spruce - Jack Pine	-	-	3	5	1	-
	Black Spruce	+	+	-	-	-	1
	Bidens	-	-	-	+	-	-
	<u>Spiraea alba</u>	-	-	-	-	+	-
	<u>Juniperus</u>	-	-	-	-	-	-
	<u>Aqueligia</u>	-	+	-	1	-	-
	<u>Lythrum</u>	+	-	-	-	-	-
	<u>Vaccinium</u>	+	-	2	-	-	-
	<u>Raspberry</u>	+	3	-	-	-	-
	<u>Aralia hispida</u>	1	-	-	-	-	-
	<u>Convolvulus</u>	-	-	-	+	-	-
	Grass and Sedge	-	-	-	1	-	-
% Ground-Layer	<u>C. mitis</u>	15	40	30	30	10	15
	<u>C. uncialis</u>	5	20	15	30	15	15
	<u>C. rangiferina</u>	65	1	30	15	25	40
	<u>C. alpestris</u>	1	-	-	-	1	5
	<u>C. gracilis</u>	-	-	-	-	-	1
	<u>C. amaurocraea</u>	+	5	-	+	-	1
	<u>Stereocaulon sp.</u>	-	+	-	-	+	-
	<u>C. degenerens</u>	+	+	+	+	-	-
	<u>C. coccifera</u>	-	-	5	+	+	-
	Other horn lichens	1	+	-	-	1	+
	<u>Lecidium muehlenbergii</u>	-	-	-	-	-	-
	<u>Linnea borealis</u>	-	-	-	+	+	-
	<u>Gaultheria hispida</u>	-	-	-	-	+	-
	Moss	10	-	20	5	40	10
	Bare Rock	-	30	2	20	3	10
	Depth of Peat Over Rock	$\frac{1}{2}$ "	$\frac{1}{2}$ "-1"	$1\frac{1}{2}$ "	$\frac{1}{2}$ "	1"	$1\frac{1}{2}$ "
	Av. Height of Lichens in C.M.	<u>C. rangiferina</u> 6		<u>C. mitis</u> 3-4 <u>C. uncialis</u>	2-4	<u>C. rangiferina</u> 7.5-13 <u>C. alp.</u> 10.6	8-10
	% Utilization of Lichens		20%	50%	<u>C. uncialis</u> 50%		

Six plots typical of the ground lichen stands in the area, each approximately 100 square yards in area were sampled (see Table II).

The most important single fact which this table illustrates is the immaturity of the lichen stands i.e. 50-85% of the plots covered by subclimax, C. uncialis, C. mitis and C. rangiferina and only 1-5% covered by C. alpestris.

TABLE III - Caribou Observations

Date	Number	Sex and Age	Location
July 2	2	Adult doe and calf	Haggart Lake (island)
July 3	2 or 3	Unidentified	Bog N. of Haggart Lake
July 3	2	Adult doe and calf	Haggart Lake (swimming)
July 8	2	Adult doe and fawn	Haggart Lake (swimming)
July 11	5	Young stags? <u>small antlers</u>	Irregular Lake (mainland)
July 14	1	Young stag	Irregular Lake (mainland)
July 14	1	Adult doe	Mather Lake (island)
July 15	1	Yearling stag	Irregular Lake (swimming)
July 16	1	Yearling stag	Irregular Lake (swimming)*
July 17	1	Adult doe?	Mather Lake
July 18	2	Adult doe and calf	Beamish Lake and island
TOTAL	21		

* Collected skeleton now at Maple.

1. No. of Observations and Herd Structure Throughout the Year

A total of 21 caribou were seen during the course of the study. The largest aggregation seen was comprised of five animals, presumably stags. The large proportion of single and doe-calf observations and low proportion of large aggregations in the summer observations strongly suggests that woodland caribou roam more or less singly throughout the summer. The exception to this might be small herds of young stags travelling together during the summer.

Information gathered during early winter, early spring and summer might be interpreted as follows: Caribou travel around in small very loosely knit associations during the summer (perhaps from calving time on), upon approach of the rut, the animals become more closely associated, until large herds (35-45) are seen travelling together. This association lasts until perhaps mid January then the herds start to disperse into smaller aggregations of 6-15 animals. Then by calving time virtually all associations are broken down and pregnant does go off into separate secluded areas (islands?) to calve and stags start to range by themselves.

Due to the unexpected motility of the animals and the fact that no suitable lookouts could be found, long term observations on single animals or groups of animals were virtually impossible.

2. Use of Islands

Islands in the area are used extensively by caribou especially by does and their calves. Fifteen of 52 had sign of does and calves. An additional 13 had signs of unidentified caribou useage. Possibly they seek out islands as refuges from predators. From all indications and previous reports it seems possible that many does calve on the islands. Evidence which led us to suspect this was the heavy use of ground lichens both as food and by excessive trampling on several of the islands investigated. These two factors indicated that caribou had spent long periods of time on certain islands. Further corroborating evidence was the large number of caribou crossings on these same islands.

3. Caribou and Water

It appears that caribou are quite amphibious. Ten of 21 caribou observed were either swimming at the time of initial observation or took to the water as a means of escape from the observers. By July 2 at least, calves can swim with dexterity equal to any adults seen and with almost as much speed.

The rate at which does and calves swam was surprisingly rapid (approximately 5-6 miles per hour).

That caribou should be good swimmers is actually essential in this area as approximately one half of the total area is comprised of water in the form of small ponds, lakes and streams.

One island in Bulging Lake at least one mile from the nearest shore had been visited by a caribou some time after break-up. This of course meant that the animal would have had to swim one mile to the island and at least another mile to the mainland again.

If live animals were required for food habits studies or zoo specimens, exploitation of this swimming behaviourism would greatly facilitate capture of caribou for the animals are virtually helpless while swimming in deep water.

4. Sex and Age Ratios

Unfortunately not enough animals were observed to give a reliable estimate of the sex and age ratios. Four of six does observed had single calves and it was suspected that one of the two single does might have had a calf hidden near by. This would indicate that the rate of calving and calf survival is quite high in the area.

Eight of 14 adult caribou sexed were presumed to be stags.

5. Calf Mortality

No sign of calf mortality was observed on any of the 52 islands investigated. This together with the fact that at least four of the six does observed had calves, as stated above, suggest a good rate of calf survival. To better determine the extent of calf mortality, extensive fieldwork should be carried out in this area immediately after calving. A project of this type has been planned for the spring of 1960.

6. Shedding of Doe Antlers

None of the four does seen with calves had antlers which showed at all. One of the two single does also did not have antlers. It is believed that pregnant female barrenground caribou do not shed their antlers until after they have their calves. Likely this is so with woodland caribou also. This spring's fieldwork should shed much light on this question.

7. Development of Antlers

None of the animals observed had very large sets of antlers. This was rather surprising and may suggest either that we did not see any of the more prime stags or that the antlers of animals in this more southern area are much slower in developing than in caribou along the Hudson Bay coast.

8. Use of Salt Licks

One salt lick about 300 feet square was located in a bog just north of Haggart Lake. Many moose and more caribou tracks were clearly defined in the semi solid mud which constituted the lick.

The Indian assistants stated that they knew of at least two other licks in the same general area. These unfortunately were not investigated.

Perhaps long term observations at salt licks would be very rewarding in a study of caribou behaviour.

Summary

A preliminary summer study of woodland caribou was made in the former Woodland Caribou Crown Game Preserve from July 2-27.

1. Woody and herbaceous vegetation constitutes a large proportion of the summer food of caribou. Aspen, birch and pin cherry being most important.
2. The sub-climax ground lichens are utilized extensively by caribou during the summer.

3. Tree lichens mainly Evernia mesomorpha and Usnea comosa are also used when available during the summer.
 4. Trampling and trailing by caribou and moose causes much loss of ground lichens during the hot dry periods of the summer.
 5. Most of the range in this area supports a sub-climax stand of lichens consisting mainly of Cladonia uncialis, C. mitis and C. rangiferina.
 6. Twenty-one caribou were observed during the study and no groups consisted of more than five animals.
 7. It is believed that the groups of caribou seen in late winter disperse just prior to calving time.
 8. Islands perhaps play a role in the protection of caribou calves from predators.
 9. Caribou are quite amphibious and often take to the water as a means of escape.
 10. Calves are very strong swimmers by July?
 11. Estimated speed of caribou when swimming is 5-6 m.p.h.
 12. Caribou could easily be caught in the water.
 13. Eight of 14 sexed adults were stags.
 14. At least four of six does observed had calves and no sign of calf mortality was observed.
 15. None of the does with calves had begun to develop new antlers.
 16. No animals seen during the study had large sets of antlers.
 17. Salt licks are apparently utilized by caribou - one was located.
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SAMPLE SIZE TO FIND HUNTER SUCCESS

by
R. Boulton

Abstract

This paper is designed to answer the question - How big a sample is needed to get an acceptable estimate of hunter success? Sample size depends on the error which the Fish and Wildlife Supervisor is willing to accept, the confidence limits which suit his needs, and the hunter success rate found in previous years. Four equations and two worked out examples planned to supply all the basis required to decide sample size according to the District's circumstances are presented.

At a Fish and Wildlife meeting of five Districts in Port Arthur on March 17th and 18th, 1960 it was asked how big a sample is needed to get an acceptable estimate of hunter success. The reference was to the questionnaire mailed to moose hunters by District offices. Time and money are needed to mail the questionnaires and make follow-ups. Until now rule-of-thumb proportions have been taken of the total number of hunters.

Sample size depends on the error which the Fish and Wildlife Supervisor is willing to accept, the confidence limits which suit his needs, and the hunter success rate found in previous years. These features sound unwieldy but two examples will show that they present no difficulty.

The following four equations supply all the basis required to decide sample size according to the District's circumstances:

$$80\% \text{ confidence limits, } N = 1.64 SF/x^2$$

$$90\% \text{ confidence limits, } N = 2.71 SF/x^2$$

$$95\% \text{ confidence limits, } N = 3.84 SF/x^2$$

$$99\% \text{ confidence limits, } N = 6.64 SF/x^2$$

where N is the number in the sample,

S is the percentage of successes,

F is the percentage of failures

(S plus F equals 100),

x is the acceptable error.

As the first example suppose the District has a very important non-resident moose hunt. It will be satisfactory to come within five percent of the correct rate of hunter success, but the Supervisor wants to minimize the risk of being more than five percent from the correct answer. He would set x at five and use the equation with 99% confidence limits. If experience has told him that hunter success runs at about 60 percent the equation would be

$$N = \frac{6.64(60)(40)}{(5)(5)} = 637.44 \text{ or say } 640$$

The Supervisor would mail enough questionnaires to get back 640 replies.

For the second example suppose the District has an unimportant resident moose hunt and the Supervisor merely wants to keep track of it. He might be satisfied to come within ten percent of the true success rate. Since this is a fairly liberal margin of acceptable error he might decide not to take too big a risk of being wrong. Therefore he decides to use the equation for 95% confidence limits which gives

$$N = \frac{3.84(60)(40)}{(10)(10)} = 92.16 \text{ or say } 95$$

If the returns from these 95 questionnaires show a success rate of, say, 58% the Supervisor would say the success rate lies between 48 and 68 percent with five chances in a hundred as the risk of being wrong.

The equations have a built-in safety feature. Examination will show they call for the biggest sample when the success rate is 50%. If the success rate is lower or higher than 50% the sample will be smaller. Therefore when in doubt play safe by using 50 for S and F.

The equations were obtained from the variance for a binomial distribution, (Npq). The confidence limits were derived from a table of "t" (d.f. = infinity).

REPORT OF THE MEETING OF THE TECHNICAL SECTION,
MISSISSIPPI FLYWAY COUNCIL
FEBRUARY 16-18, 1960, STUTTGART, ARKANSAS

by
H. G. Lumsden

Abstract

Built up from a low of 40,000 in January 1946 to 388,000 in January 1958 the Mississippi Flyway population of Canada Geese was down to 256,000 in January 1960. The Council recommended a reduction of the kill in fall of 1960. Because of serious drought conditions on the prairies Canvasback numbers were at their lowest level since the advent of modern survey methods. From an estimated 600,000 birds in January, 1954, this species had been reduced to 150,000 birds in January, 1960, a 75% decline. Redhead numbers were drastically reduced also and the emergency called for more protection for this species. The following measures for correcting the situation were considered: (1) closure of the season completely on Canvasbacks and Redheads, (2) close of the season on these two species but permitting one mistake bird in the bag, (3) closure of areas known to be concentration points for Canvasbacks and Redheads. The Mallard had also suffered from the prairie drought and the production of young birds was the lowest in 1959 since records had been kept. Losses from lead poisoning annually amount to about 3% of the flyway population of ducks. As a means of correcting this situation the use of iron shot was considered and a resolution was passed recommending that the Council ask the Wildlife Management Institute to approach Olin Industries to carry out field tests using iron shot. The water situation on the prairies and the banding of ducks are also discussed.

On February 15 I left Ontario by air to attend the winter meeting of the Technical Section of the Mississippi Flyway Council. About 50 delegates were present from all states in the Flyway, the U.S. Federal Bureau of Sport Fisheries and Wildlife, and the Canadian Wildlife Service. All were biologists engaged in research and management of the waterfowl resource.

The meetings ran through February 16 and 17. On the 18th of February the scheduled field trip - a flight over the Arkansas river bottoms - was cancelled due to bad weather and I returned to Ontario.

The following notes that I took during the discussions cover problems that concern us to some extent in Ontario.

Canada Geese

I have been asked to serve on the Canada Goose Committee and attended a special evening meeting to discuss action on current problems. The following gives some of the background:

The bulk of the Canada geese of the Mississippi Flyway breed in Ontario. Over 90% of them winter on about 16 state and federal refuges in the U.S.. Most of the kill of Canada Geese occurs round these refuges and it can be controlled by varying the amount of food made available. A reduction of food on a refuge forces the birds to visit farmland while an increase in the food supply draws them into the refuge again. Cob corn is the best and most frequently used food.

Through careful management the Flyway population of Canada Geese has been built up from a low of just over 40,000 in January, 1946 to a peak of 388,000 in January, 1958.

Factors unknown at present and perhaps overshooting have reduced the population to 256,000 in January, 1960. And if the population is to recover the kill must be reduced in the fall of 1960. Since relatively few Canada geese are shot in Ontario by licensed sportsmen there is little that we can do to help, however we may be involved in discussion with the Flyway Council because of the Indian kill.

The Flyway population of Canada geese breaks down into a number of discreet units. One of these which is called the Great Lakes Flock breeds entirely in the Patricias, on migration it passes through Wisconsin and winters in southern Illinois. In January, 1956 at its peak it numbered 225,000 in January, 1959 through over shooting it has been reduced to about 134,000.

Analysis of the age composition of the flock at this time indicates that next spring there will be probably not more than 13,000 breeding pairs. This has come about because juvenals are more vulnerable to hunting than older birds. The age class that should be maturing this year is a small one due to overhunting in the past.

If breeding conditions are normal in the spring of 1960 we can expect a crop probably not exceeding 34,000 young.

After considerable discussion it was decided that the kill in this flock should not be permitted to exceed 20,000 in 1960. In 1959 Wisconsin alone killed about 20,000 and the total kill from this flock was about 55,000 in the U.S.

The normal kill by Indians in the Patricias is about 8,000 Canada geese. This will leave 12,000 to be shared throughout the Flyway. There appears to be some jealousy between the states over the kill of Canada geese. Illinois and Wisconsin have been unable to agree on a quota through which the harvest can be shared. It is likely that there will be recriminations and the Indian kill will be questioned. We should present a statement to the Council outlining the circumstances surrounding the Indian kill and placing on record our views concerning restriction of this kill.

Canvasbacks and Redheads

In 1959 the Canvasback populations of the eastern parts of the continent dropped to their lowest levels since the advent of modern survey methods. At their peak of numbers in January, 1954 the eastern Canvasback population was estimated about 600,000 birds. In January, 1960 the estimate was 150,000 - a 75% decline.

Under normal conditions Canvasbacks have the highest nest success rate (80%) of any duck so far studied. They also withstand close to the highest mortality rate from hunting (about 70% for juvenals and 40% for adults). In spite of this under normal conditions they have been able to hold their own or even increase. Now however, with the drought on the prairies which has dried up or rendered useless for breeding most of the pot-holes, the Canvasback situation is serious.

In 1958 the daily limit of Canvasbacks was reduced in the U.S. to two birds per day and in 1959 to one bird. In Ontario the limit was reduced to four Canvasbacks or Redheads per day in 1959. Further restriction in the kill will be necessary in 1960.

The Redhead situation is similar and a great deal more protection will be necessary for this species also.

The following measures for correcting the situation were discussed:

1. Closure of the season completely on Canvasbacks and Redheads.

This measure will raise enforcement problems. A great many hunters cannot identify duck species in the hand and certainly could not distinguish these species on the wing. If enforced rigorously this measure would result in the conviction of many hunters for an offence for which there was no intent and hence no guilt.

2. Closure of the season on these two species but permitting one mistake bird in the bag.

This situation in effect existed in the U.S. last fall. The one bird in the bag regulation was accompanied by one of the most elaborate publicity programs in the history of waterfowl management to inform hunters of the need to preserve Redheads and Canvasbacks. In spite of this some hunters took advantage of the loophole and some complete Canvasback decoy setups were observed.

In Ontario our bag limit could be reduced from the four permitted in 1959.

3. Closure of areas known to be concentration points for Canvasbacks and Redheads.

In Ontario, Lake St. Clair, and to a lesser extent, Rondeau Park and Long Point are the only concentration areas for the endangered species. The first two areas are the only good places in southern Ontario where the public at large can get diving duck shooting. Long Point is mostly private where the Canvasbacks concentrate.

Band returns indicate that the Canvasback kill in Ontario equals that in Michigan and is about the fourth highest among all the states and provinces.

Ontario should take effective steps to reduce the kill of these species in 1960.

Mallards

Since 1956 about 3.5 million Mallards have been shot annually in the Mississippi Flyway. This species comprises about 60% of the bag. Banding recoveries suggest that the annual kill constitutes about half the total Flyway population.

The proportion of young birds in the bag in 1959 was the lowest on record with that of 1958 next lowest.

The drought on the prairies has been the cause of their low productivity and if we are to restore the Mallard to more desirable population levels the kill must be reduced.

In Ontario we shall on the whole be little affected by the decline of the prairie breeding populations of dabbling ducks as far as hunting is concerned. However, several people at the meeting pointed out to me that when the big waterfowl production centres are affected by drought the waterfowl production of Ontario becomes more important, to the Flyway as a whole.

The Water Situation On the Prairies

The fall of 1959 in the best duck producing part of the prairies was wet and freeze up came early. Snowfall has been greater than in the previous two winters but is no greater than the long term average to date. Water conditions in the pot-holes will depend on March snowfall. If unusually large amounts fall this month waterfowl breeding conditions will be improved but two or three years of good run-off will be necessary to restore conditions to those we experienced in the early 1950's.

Prospects for improved water levels look good east of a line from Kindersly to Swift Current. West of this line a poor run-off is expected and the outlook is not good. It will take two or three years for normal stands of emergent aquatic plants to become established after water levels recover, so that we cannot expect an improvement in the diving duck situation and particularly in Canvasbacks and Redheads this summer. Dabbling ducks particularly Mallards may make some recovery if run-off is good.

Banding

In 1959 about 35,000 ducks were banded in Canada of which 10,000 were Mallards. A series of banding stations have been set up right across the continent spaced about 100 miles apart. These stations have an objective to band 1,000 Mallards each so that mortality rates through band returns can be studied. Most stations succeeded in reaching their objective in 1959 and will produce about 100 direct recoveries each for analysis.

Recoveries indicated a heavy kill of Mallards in 1959 in Canada, mostly from southeastern Manitoba. About 36% of the Union County, Illinois banding station recoveries were from this area.

The Flyway has an objective to band 300 Wood Ducks per year in each state. In 1959, 14 states banded 4,949. Ontario has not participated in this program and only about 16 Wood Ducks were banded by the sportsmen at Oshawa.

Ontario operated a banding station at Gogama and another on the Burrows Lake chain at Geraldton in 1959. This was at the request of the Atlantic Flyway Council through their interest in Black Ducks. We did not participate in any of the Mississippi Flyway banding programs in 1959.

Lead Poisoning

Losses from lead poisoning annually amount to about 3% of the Flyway population of ducks. This may equal the entire annual production of such areas as the 4,000 square mile highly productive Minedosa pot-hole country in Manitoba. It would cost an immense sum to artificially produce an equivalent number of ducks to that lost through lead poisoning.

Iron shot would seem to be the answer. Disadvantages, however, are as follows:

1. It would cost the ammunition industry about one million in capital investment to produce the shot for commercial use.
2. Acceptance by hunters is likely to be poor due to anticipated loss of range. Studies are needed to determine the extent of this factor. Iron shot can be annealed to make it so soft that it will not affect gun barrels. Ten thousand rounds have made no difference to barrels in tests.

After much discussion a resolution was passed recommending that the Council ask the Wildlife Management Institute to approach Olin Industries to carry out field tests of the iron shot to measure difference in penetration and killing power from lead shot.

Kill Survey and Duck Wing Study

The U.S. Bureau of Sport Fisheries and Wildlife conducts a kill survey by mail annually using duck stamp sales records from which to draw a sample. This year a sample of hunters received a request prior to the season to save one wing from each duck shot and send it in for study. From this species composition of the bag and the age and sex of the bird could be determined.

About 10,000 wings were received from throughout the U.S. of which 4,329 were Mallards. The results of the analysis of this sample confirmed the findings from the field checks - that Mallard production was the lowest in 1959 since records have been kept.

Ontario has not participated in this wing collection except for a special study of Canvasback wings collected in Erie District for Mr. D. Olsen.

The Gruneau Research study may give us some estimate of duck kill in the province.

REPORT ON THE HUNTER SURVEY FOR THE 1958-1959 HUNTING
SEASON IN THE LAKE SIMCOE DISTRICT

by
A. A. Wainio

Abstract

In the spring of 1959 the District Office chose at random 10 per cent of 8,000 hunters who bought licences to hunt in the regulated townships of Lake Simcoe District during the season of 1958-59 and sent them hunter survey questionnaire forms along with a letter explaining the reason for the survey. A total of 335 hunters or 39.8 per cent returned the forms. From the returns it was possible to calculate the number of hunters using dogs; the average number of days hunted; the favourite month for hunting and the break down of the total bag. Tables are presented showing hunter response to the survey forms, the distribution of the hunting pressure and the total kill for each of the regulated townships. From the questionnaires returned it was learned that 40.7 per cent of the hunters used dogs and these hunters secured 60.9 per cent of the total bag. Hunters spent 7.7 man-hours afield per animal killed and averaged 7.0 animals per bag. Each hunter spent an average of 4.2 hours hunting per day.

In the spring of 1959 the District Office at Maple sent questionnaire forms to 840 hunters who bought licences to hunt for the winter of 1958-59 in the 16 regulated townships of the Lake Simcoe District. We chose at random 10% of the 8000 and more hunters who bought licences. With the form we included a letter explaining the reason for our survey and a brief report on a pheasant-hunt survey carried out last fall.

Of the 10% contacted, 39.8% returned the forms. This is a low return. In order to secure a better response we should have sent a follow-up letter about two or three weeks after the hunters had received the questionnaire. This letter would have reiterated the importance of the survey and added a note of urgency so that more would have replied. From these filled out forms we learned the following facts - 40.7% of the hunters used dogs and these hunters secured 60.9% of the total bag; the hunters averaged 667.4 hunting days per month from October to February inclusive; the hunters spent 7.7 man-hours per animal killed and each man averaged 7.0 animals per bag; also they averaged 4.2 hours of hunting per day.

The figures on the hunters success are probably biased towards the most successful hunters. The high figures for the numbers of small game per bag seems to indicate this. Similarly the fact that 40% of the hunters used dogs and bagged such a high percentage of game shows that a large number of our returns were from the most ardent hunters. These more zealous hunters probably answered the survey form as soon as possible while a follow-up letter would most likely solicit replies from the more unsuccessful ones. A second such letter would likely attract the still poorer hunters. Such follow-up letters should be employed to secure a better response and to see if such a gradation of hunters results.

The percentage of hunters using dogs is high. With more of the poorer and more unsuccessful hunters reporting, this percentage probably would have gone down. This percentage gives a picture of the hunt slanted to the more zealous hunters with dogs. The hunters' ego and the long interval between the time the men hunted and the time the questionnaire was received probably contributed to a higher reported bag.

Table I gives the composition of the total reported bag.

TABLE I -

<u>Game Species</u>	<u>Percent of the Total Bag</u>
Pheasants	12.9
Fox	9.6
Jack rabbit	25.1
Snowshoe rabbit	4.1
Ruffed Grouse	2.4
Cottontail rabbit	45.8

From Table II outlining the response to our survey forms one can see that there is no real difference between the residents and non-residents; one would expect residents to show a greater response but this does not appear to be so with this survey. This especially applies to Markham, Vaughan, King and Whitchurch. The analysis of the snowshoe rabbit bag can pretty well be ignored for practically all of the 16 regulated townships lie in the southern half of our district where the snowshoe is almost non-existent. The grouse season ended in November yet some of the hunters reported shooting ruffed grouse in December, January and February.

From Table VI showing the total kill of each animal in each of the 16 regulated townships a graph could be drawn showing how the total kill varies from township to township for each animal. However, this does not seem sound for the total kill in each case is based on such a small number of hunters reporting and a small bag count.

Calculations of total kills should be figured only after a good return of hunter reports is received. Included are the results of an independent pheasant survey carried out during the 1958 pheasant season (see Table VII). The difference between the two pheasant surveys is quite noticeable. The survey carried out during the season is far more reliable for in it the officers checked only those hunting pheasants while the hunters reporting our mail survey include many who bought licences after the pheasant hunt. Also the separate, short survey deals with a more mathematically sound proportion of men hunting and of pheasants shot.

Included with this report are the letters and survey form we mailed to the hunters (see sheet 1, 2 and 3).

Such a mailed survey as this is worthwhile. Granted it has its drawbacks as indicated previously, however, it gives the district office an idea of where the hunting pressure is the greatest, how this hunting pressure varies from year to year and from township to township and above all it gives an overall general picture which is an excellent reference for future use.

TABLE II - Showing the Response to the Hunter Survey Form
In the 16 Regulated Townships of the Lake Simcoe District.

Township	Residents			Non-Residents	
	Total Addresses Contacted	Total No. Sent Out	Total No. Returns	Total No. Sent Out	Total No. Returns
Adjala	18	5	2	13	5
Albion	44	13	7	31	10
Caledon	37	18	10	19	9
Chinguacousy	51	23	8	28	9
Toronto Gore	14	4	1	10	3
W. Gwillimbury	23	11	4	12	5
E. Gwillimbury	12	6	3	6	1
King	78	27	8	51	19
Markham	82	41	14	41	23
Pickering	103	65	19	38	24
Toronto	88	58	30	30	9
Tecumseth	47	14	4	33	17
Whitby	49	21	7	28	9
Vaughan	97	30	15	67	24
Whitchurch	64	27	11	37	16
E. Whitby	33	10	2	23	7
Total	840	373	145	467	190

$$\text{Per cent of residents who answered} = \frac{145}{373} \times 100 = 39\%$$

$$\text{Per cent of non-residents who answered} = \frac{190}{467} \times 100 = 40\%$$

$$\begin{array}{l} \text{Per cent of returns, residents and} \\ \text{non-residents} \end{array} = \frac{335}{840} \times 100 = 39.8\%$$

TABLE III - Showing the Distribution of Kill Between Residents and Non-residents
In the 16 Regulated Townships of the Lake Simcoe District During
October to November 1958 - 1959.

	Pheasants		Fox		Jack Rabbit		Snow Rabbit		Ruffed Grouse		Cott. Rabbit	
	Res.	Non Res.	Res.	Non Res.	Res.	Non Res.	Res.	Non Res.	Res.	Non Res.	Res.	Non Res.
No. of Game Shot	108	169	105	103	153	386	21	66	16	36	325	666
% of Game Shot	38.9	61.1	50.5	49.5	28.4	71.6	24.1	75.9	30.8	69.2	32.8	67.2

Total Kill = 2154.

Per cent of Total Bag Shot By Residents = 33.8

Per cent of Total Bag Shot By Non-Residents = 66.2

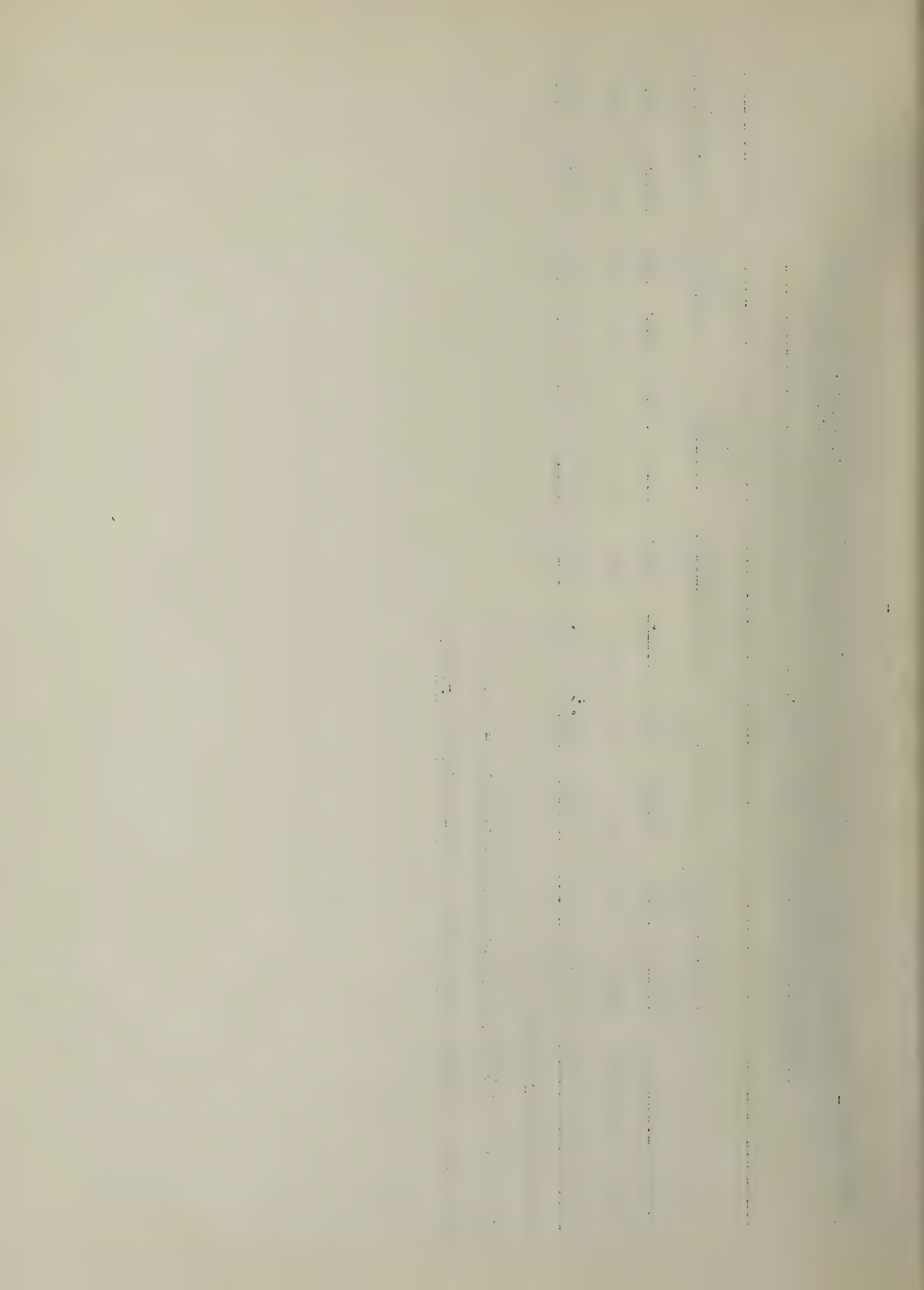


TABLE IV - Showing Analysis of Hunter Survey Forms Filled In For Hunting Season 1958-1959 in the 16 Regulated Townships of the Lake Simcoe District.

Townships	Total Licences Sold	Reported Licencee Hunting	Number of Hours Hunting	Total Game Bagged Each Township	Game Per Hunter	Man-Hrs. Per Game
Whitby	464	13	839	88	6.8	9.5
East Whitby	255	9	296	43	4.8	6.9
Pickering	1008	34	2286	234	6.9	9.8
Markham	810	37	1773	379	10.2	4.7
Whitchurch	580	24	763	106	4.0	7.2
Vaughan	961	35	1585	128	3.7	12.4
King	900	26	1241	251	9.7	4.9
E. Gwillimbury	116	4	482	10	2.5	48.2
Toronto	856	38	1997	225	5.9	8.9
Toronto Gore	135	3	315	74	24.7	4.3
Chinguacousy	504	16	1048	121	7.6	8.7
Albion	408	16	1085	173	10.8	6.3
Caledon	337	18	918	103	5.7	8.9
Adjala	159	7	504	26	3.7	19.4
Tecumseth	470	20	1085	160	8.0	6.8
W. Gwillimbury	223	8	371	28	3.5	13.3
Total	8186	307	16588	2149	7.0	7.7

TABLE IV - cont.....

Townships	Days Hunted During			Total Days Hunted In Township	Total Kill	Number Using Dogs	Game Bagged Using Dogs	Game Per Hunter Using Dogs
	Oct.	Nov.	Dec.	Jan.	Feb.			
Whitby	39	44	31	32	34	5	21	4.2
East Whitby	15	18	8	13	8	2	24	12.0
Pickering	75	112	122	91	90	9	51	5.7
Markham	68	77	82	73	62	25	327	13.1
Whitchurch	29	40	32	20	19	9	67	7.4
Vaughan	52	49	71	60	65	14	102	7.3
King	40	58	63	61	36	14	221	15.8
E. Gwillimbury	6	20	24	16	32	3	10	3.3
Toronto	78	107	95	89	81	11	140	12.7
Toronto Gore	16	13	11	21	10	1	58	58.0
Chinguacousy	49	39	56	43	31	7	92	13.1
Albion	25	42	57	49	22	7	83	11.9
Caledon	30	54	58	33	21	8	61	7.6
Adjala	9	14	25	16	13	2	11	5.5
Tecumseth	26	43	51	41	25	4	28	7.0
W. Gwillimbury	8	15	24	18	8	4	12	3.0
Total	557	744	807	673	556	125	1308	10.5

TABLE V - Part I - Table Showing Analysis of the Bag Shot By Reporting Hunters During Oct.-Feb., 1958-59 In the 16 Regulated Townships of the Lake Simcoe District.

Township	Number of Animals Bagged						No. of Pheasants Bagged	
	Pheas.	Fox	Jack Rabbit	Snow Rabbit	Grouse	Cott. Rabbit	October	November
Whitby	13	2	7	-	4	62	8	5
East Whitby	12	-	5	4	5	17	8	4
Pickering	27	22	26	7	10	142	23	4
Markham	82	23	95	20	-	159	75	6
Whitchurch	21	6	27	4	5	43	8	12
Vaughan	14	19	40	3	3	49	14	-
King	25	20	46	16	4	140	25	-
E. Gwillimbury	-	1	3	2	1	3	-	-
Toronto	40	37	67	2	1	78	38	2
Toronto Gore	6	6	9	4	-	49	4	2
Chinguacousy	20	11	24	-	-	66	20	-
Albion	2	28	46	3	9	85	-	2
Caledon	13	17	33	14	-	26	11	2
Adjala	1	1	18	3	-	3	1	-
Tecumseth	-	14	80	5	10	51	-	-
W. Gwillimbury	1	1	14	-	-	12	1	-
Total	277	208	540	87	52	985	236	39

TABLE V - Part 2 - Table Showing Analysis of the Bag Shot By Reporting Hunters During Oct.-Feb., 1958-59 In the 16 Regulated Townships Of the Lake Simcoe District.

Township	Number of Fox Bagged In			Number of Jack Rabbits Bagged In			Number of Snowshoe Rabbits Bagged In			
	Oct.	Nov.	Dec.	Jan.	Feb.	Oct.	Nov.	Dec.	Jan.	Feb.
Whitby	-	4	-	1	-	1	2	1	1	-
East Whitby	-	-	-	-	-	-	-	-	-	-
Pickering	3	6	3	5	5	8	11	3	12	9
Markham	6	9	4	4	-	21	16	6	3	4
Whitchurch	-	2	3	-	1	7	7	-	2	1
Vaughan	1	7	4	4	2	10	9	2	8	-
King	5	6	3	5	1	9	9	3	-	-
E. Gwillimbury	-	1	-	-	-	1	1	1	1	-
Toronto	5	6	18	7	1	19	13	-	8	-
Toronto Gore	1	-	-	4	1	1	5	-	1	-
Chinguacousy	3	1	3	4	2	10	4	-	-	-
Albion	-	7	8	10	1	13	18	-	-	-
Caledon	3	6	5	2	2	12	7	1	-	-
Adjala	-	1	-	-	4	4	2	-	1	-
Tecumseth	3	3	2	3	8	24	12	-	2	1
W. Gwillimbury	-	-	-	1	-	4	7	-	-	-
Total	30	59	83	50	18	194	123	26	32	15

TABLE V - Part 2 cont.....

Township	Number of Ruffed Grouse Bagged In				Number of Cottontail Rabbits In					
	Oct.	Nov.	Dec.	Jan.	Feb.	Oct.	Nov.	Dec.	Jan.	Feb.
Whitby	4	-	-	-	-	5	11	14	16	16
East Whitby	2	3	-	-	-	6	6	1	-	4
Pickering	7	2	-	-	1	18	43	39	29	26
Markham	-	-	-	-	-	21	46	38	21	34
Whitchurch	-	3	1	-	1	5	14	13	8	2
Vaughan	-	2	1	-	-	9	18	11	3	4
King	4	-	-	-	-	15	23	41	38	22
E. Gwillimbury	1	-	-	-	-	-	1	-	1	1
Toronto	1	-	-	-	-	11	18	23	19	7
Toronto Gore	-	-	-	-	-	13	11	8	6	11
Chinguacousy	-	-	-	-	-	11	19	21	5	12
Albion	1	6	-	2	-	1	20	23	26	15
Caledon	-	-	-	-	-	1	4	9	7	8
Adjala	-	-	-	-	-	-	2	-	1	-
Tecumseth	7	3	-	-	-	11	8	13	7	9
W. Gwillimbury	-	-	-	-	-	-	2	3	4	3
Total	27	19	2	2	2	127	246	257	191	174

TABLE VI - Table Showing Total Kill of Each Animal In Each of the 16 Regulated Townships In the Lake Simcoe District.

Township	Total Lic. Sold	Hunters Reporting	Pheasants			Fox			Jack Rabbit		
			No. Shot	Pheas. Per Hunter	Total Kill	No. Shot	Fox Per Hunter	Total Kill	No. Shot	Rabbits Per Hunter	Total Kill
Whitby	464	16	13	.8	400.4	2	.13	60.3	7	.45	208.8
E. Whitby	255	9	12	1.3	331.5	-	-	-	5	.56	142.8
Pickering	1008	43	27	.63	635.	22	.51	514.	24	.56	564.5
Markham	810	37	71	1.9	1539.	23	.62	502.	95	2.6	2106.
Whitchurch	580	27	21	.78	452.4	6	.22	127.6	28	1.05	609.
Vaughan	961	39	14	.36	346.	19	.49	470.9	40	1.03	989.8
King	900	27	25	.93	837	20	.74	666.	46	1.7	1530.
E. Gwillimbury	116	4	-	-	-	1	.25	29.	3	.75	87.
Toronto	856	39	40	1.03	881.7	37	.95	813.	68	1.7	1455.
Toronto Gore	135	4	6	1.5	202.5	6	1.5	202.5	9	2.3	310.5
Chinguacousy	504	17	20	1.2	604.8	11	.65	327.6	24	1.4	705.6
Albion	408	17	3	.18	73.4	28	1.6	652.8	39	2.3	938.
Caledon	337	19	13	.68	229.2	16	.84	283.1	33	1.7	573.
Adjala	159	7	-	-	-	1	.14	22.3	15	2.1	334.
Tecumseth	470	21	-	-	-	14	.67	315.	80	3.8	1786.
W. Gwillimbury	223	9	1	.11	24.5	1	.11	24.5	14	1.6	357.
	8186	335	266	.88	6207	207	.62	334.	530	1.60	12697.

TABLE VI cont.....

Township	Snowshoe Rabbit			Ruffed Grouse			Cottontail Rabbit		
	No. Shot	Rabbits Per Hunter	Total Kill	No. Shot	Grouse Per Hunter	Total Kill	No. Shot	Rabbits Per Hunter	Total Kill
Whitby	-	-	-	4	.26	116.	62	3.9	1810
E. Whitby	4	.44	112.2	5	.56	142.8	17	1.9	485
Pickering	27	.63	635	10	.23	231.8	148	3.4	3427
Markham	4	.11	89.1	-	-	-	159	4.3	3483
Whitchurch	3	.11	63.8	5	.19	110.2	42	1.6	928
Vaughan	3	.08	76.9	3	.08	76.9	49	1.3	1249
King	12	.44	396	2	.07	63	140	5.2	4680
E. Gwillimbury	2	.50	58	1	.25	29	3	.75	87
Toronto	2	.05	42.8	1	.03	25.7	78	2.0	1712
Toronto Gore	4	1.0	135	-	-	-	49	12.3	1661
Chinguacousy	-	-	-	-	-	-	66	3.9	1966
Albion	6	.35	142.8	9	.53	216.2	88	5.2	2122
Caledon	14	.74	249.4	-	-	-	38	2.0	674
Adjala	-	-	-	-	-	-	-	-	-
Tecumseth	5	.24	112.8	10	.48	225.6	48	2.3	1081
W. Gwillimbury	-	-	-	-	-	-	12	1.3	290
	86	.39	2113	50	.26	1237	999	3.42	25,655

TABLE VII - Results of Independent Pheasant Survey Carried Out
During the Pheasant Season, November, 1958.

<u>Township</u>	<u>Total No. Licences</u>	<u>No. Hunters Checked</u>	<u>No. Shot</u>	<u>Pheasant Per Hunter</u>	<u>Total Kill</u>
Whitby	402	56	16	.29	117
East Whitby	177	63	14	.22	39
Pickering	970	257	71	.24	233
Markham	756	199	139	.69	522
Whitchurch	394	275	56	.23	91
Vaughan	524	18	4	.22	115
King	413	78	54	.69	285
E. Gwillimbury	-	-	-	-	-
Toronto	711	347	95	.27	192
Toronto Gore	120	11	-	-	-
Chinguacousy	359	181	38	.21	75
Albion	-	-	-	-	-
Caledon	120	67	30	.44	53
Adjala	-	-	-	-	-
Tecumseth	-	-	-	-	-
W. Gwillimbury	-	-	-	-	-
<u>Total</u>	<u>4955</u>	<u>1552</u>	<u>517</u>	<u>.33</u>	<u>1722</u>



ONTARIO

DEPARTMENT OF LANDS AND FORESTS

Maple, Ontario
March 24, 1959RE: HUNTER SURVEY

Dear Sir:

I am asking for your cooperation as a sportsman to help us further our knowledge of game and hunting conditions. As you are no doubt aware an animal or bird population is difficult to estimate. Therefore, we must depend on the results of the hunt to a large extent to provide the information necessary to manage our game and set proper seasons.

In the 16 Lake Simcoe District Regulated Townships the game harvest is taken by over 8,000 hunters. We have selected 800 hunters from the township records and are asking these persons to complete a questionnaire which simply asks "how long did you hunt" and "how much game did you bag".

You are one of these selected hunters and I would appreciate your cooperation in completing the enclosed questionnaire and returning it to us in the stamped addressed envelope provided. Even if you hunted very little this winter we would like to have the questionnaire returned.

Your comments are always welcome.

Yours very truly

(J. M. Fraser)

A. W. Leman
for District Forester

JMF/md

P.S. For your information we have enclosed a brief report on a survey we carried out after the pheasant hunt last fall.

SHEET 2



ONTARIO

DEPARTMENT OF LANDS AND FORESTS

HUNTER SURVEY-LAKE SIMCOE DISTRICT

(Fall and Winter 1958-59)

(a) Township Hunted: _____

(b) How many days did you hunt in October? _____

November _____

December _____

January _____

February _____

(c) How many hours did you hunt on an average day? _____

(d) Did you usually use a dog? _____

(e) Please fill in the game you bagged in the different months

<u>Species</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Total</u>
<u>Pheasant</u>	_____	_____	_____	_____	_____	_____
<u>Fox</u>	_____	_____	_____	_____	_____	_____
<u>Jack Rabbit</u>	_____	_____	_____	_____	_____	_____
<u>Snowshoe Rabbit</u>	_____	_____	_____	_____	_____	_____
<u>Ruffed Grouse</u>	_____	_____	_____	_____	_____	_____
<u>Cottontail Rabbit</u>	_____	_____	_____	_____	_____	_____

REMARKS:

(Signed)

SHEET 3



DEPARTMENT OF LANDS AND FORESTS

RESULTS OF HUNTER SURVEY-PHEASANT SEASON-OCTOBER, 1958
LAKE SIMCOE DISTRICT

This survey covered hunters who held township licences in 13 regulated townships of the Lake Simcoe District. These townships sold a total of 5106 hunting licences and we picked at random 642 names of licence holders and sent a questionnaire to each. We received 334 questionnaires (52%) back from interested hunters. The remaining 48% apparently were not interested in future hunting.

The 334 questionnaires returned to us provided the following information (19 did not hunt).

Number of hunters	- 315
Total hours hunted	- 3111
Number of pheasants killed	- 302 (195 cocks, 107 hens,
Number of hunting hours per bird killed	- 10.3
Number of rabbits killed	- 232
Number of fox killed	- 15
Number of ruffed grouse killed	- 4

If the hunters who completed the questionnaire are representative of all the hunters who purchased licences the pheasant kill over the 13 townships was approximately 4600.

JMF/md
Mar./59.

PHEASANT HUNT STATISTICS, 1959, LINDSAY DISTRICT

by
P. W. Swanson

Abstract

A banding program was carried out during the summer of 1959 in order to collect data for evaluating the contribution of hatchery raised stock to pheasant hunting in the Regulated Townships of Clarke and Darlington. A game bag survey card was issued with each township licence (1,327) sold. Some 233 hunters or 17.4% returned cards. From this information and the licencing records it was learned that 65% of the reported kill consisted of banded birds; 70.4% of the hunters reporting were successful in shooting at least one bird; hunter success averaged out to 2.06 pheasants per hunter; of the total kill 58.7% were cocks and 41.3% hens.

Pheasant leg banding was carried out during the summer of 1959 in the Regulated Townships of Clarke and Darlington with a total of 4,186 birds banded and released.

A total of 6,000 chicks, 500 poults and 350 adult birds were provided for release in these two townships from the Provincial Game Bird Farm at Codrington. All the adults and poults were leg banded as were 3,366 of the chicks on reaching the poult stage. The discrepancy between the 6,000 chicks provided and the 3,366 banded may be attributed partially to mortality and partially to the nature of the gentle release system whereby birds were not available for banding. The purpose of this banding program was to collect data for assessing and evaluating the contribution of hatchery raised stock to pheasant hunting and propagation in our Regulated Townships.

The open season on pheasants was from October 10th to October 31st. The daily bag limit was three birds, one (1) of which could be a hen. A game bag census or survey card was issued with each township licence sold and hunters were requested to return cards to the Lindsay office immediately following the hunt. Cards were self-addressed with postage guaranteed, but only 17.4% of the hunters returned their cards. This was disappointing and frustrating as cards dribbled in all winter making it impossible to submit a detailed report soon after the hunt was over.

The following information was extracted from the licencing records and completed survey cards:

1959 Pheasant Hunt Statistics

TABLE I - Sale of Licences and Return of Cards

	Resident	Non-Resident	Total	No. Hunters Reporting	Percent Reporting
Darlington Twp.	700	425	1,125	200	17.7%
Clarke Township	109	93	202	33	16.3%
	809	518	1,327	233	17.4%

17.4% of the hunters returned their cards.

TABLE II - Data on the Kill - Sex of Birds Shot

	Cocks	%	Hens	%	Kill Reported
Darlington Twp.	204	56.5	157	43.5	361
Clarke Township	79	65.3	42	34.7	121
	283	58.7	199	41.3	482

Of the total kill reported, 58.7% were cocks and 41.3% were hens.

TABLE III - Data on Banded and Unbanded Birds Harvested

	Banded	%	Unbanded	%	Kill Reported
Darlington Twp.	257	71.2	104	28.8	361
Clarke Township	59	48.8	62	51.2	121
	316	65.6	166	34.4	482

65.6% of the reported kill consisted of banded birds.

TABLE IV - Hunters Success

	Successful Hunters	%	Unsuccessful Hunters	%	No. of Hunters Reporting
Darlington Twp.	132	66.0	68	34	200
Clarke Township	32	97.0	1	3	33
	164	70.4	69	29.6	233

70.4% of the hunters reporting were successful in shooting one bird at least.

233 hunters reported shooting a total of 482 birds. This makes an average of 2.06 pheasants per hunter.

Although our harvest statistics are limited, we consider it to be a fair sample. By projecting the results to include the entire 1959 pheasant hunt based on total licences sold the following information becomes available.

Total Pheasants Harvested	-	2,720
No. Cock Birds in Kill	-	1,596
No. Hen Birds in Kill	-	1,124
No. Banded Birds in Kill	-	1,784
No. Unbanded Birds in Kill	-	936

Of the total (4,186) banded birds released in 1959, 1,784 or 42.4% were harvested by hunters.

WATERFOWL CAUGHT IN MUSKRAT TRAPS IN PATRICIA WEST
AND PATRICIA CENTRAL 1958-59 SEASON

by
D. W. Simkin

Abstract

Trappers were interviewed at the spring trappers' meetings in Patricia Central and Patricia West in order to determine how many waterfowl were trapped in the spring and which species are most susceptible to losses in muskrat traps. Some 694 or 83% of all trappers in the Patricias were interviewed. A total of 1,159 waterfowl was reported trapped, an increase of 25% over rat trap losses from the 1957-58 season. Twelve different species including two shovelers were reported taken. Of all the waterfowl caught 57% were mallards. A comparison with last year's maps showed very little change in distribution of waterfowl densities as calculated from the waterfowl lost in muskrat trap questionnaires. It was suggested that this type of survey be carried on for at least two more years.

For the second consecutive year all trappers interviewed at the spring trappers' meetings in most band areas of Patricia Central and Patricia West were queried as to the number of waterfowl which they had caught in their muskrat traps. A good basis for evaluating waterfowl losses by this factor was established from questionnaires filled out for the 1957-58 season but it was deemed desirable to continue the study for another one or two years to determine how variable the losses are from one year to another and over a period of years and how closely they are related to population densities.

Our main purpose this year, as last, was to determine:

- (1) How many waterfowl are trapped in the spring.
- (2) Which species are most susceptible to losses in muskrat traps.

The data collected last year led us to believe that data on waterfowl losses in muskrat traps might prove valuable in indicating areas of greatest waterfowl breeding densities. To determine the value of this method several years data should be collected and then analyzed.

Unfortunately data from some band areas checked in 1957-58 were not collected for the 1958-59 season. However, a good sample from most band areas was obtained.

Six hundred and ninety-four trappers were interviewed in 1958-59 as compared to 642 in the previous season.

How Many Waterfowl Were Trapped in the Spring

Approximately 83% of all the trappers in Patricia Central and Patricia West were interviewed last spring. To determine an estimated total kill for the band areas in which the trappers were interviewed the same method which was used last year was implemented. That is an index derived from the number of muskrats caught per duck by the interviewed trappers in each band area was applied to the total rat kill for the respective band area.

Table I shows the reported kill by band area as well as the estimated kill within each band area. The estimated total of 1834 waterfowl for 1959 is 25% higher than the kill of 1467 estimated in 1958.

Using the same surmissals as last year. i.e. two-thirds of the birds are breeders and sex ratio of 60 males per 40 females, and an average of three young per brood reaching flying stage in the succeeding fall. This loss of 1828 birds to muskrat traps theoretically decreased the fall population by approximately 3300 birds.

The question now is, does this increased kill reflect an increase in the northward migrating population of waterfowl? We believe that it should. It will be interesting to see what change occurs next spring when a population of waterfowl, ducks mainly, which we believe had a poor breeding year in 1959 and hence should be considerably reduce, comes back into its breeding ground.

We still believe that the kill reported is not critical in terms of the number of waterfowl available to the Canadian hunter; however, in future years when hunting takes a larger proportion of the waterfowl population it might be necessary to require the trappers to take precautions to prevent waterfowl from getting caught in rat traps.

What Species Were Most Susceptible to Trapping Losses

The various species of waterfowl reported trapped in the area are not equally numerous in the Ontario part of their range and as yet no intensive inventory of these birds has been done in the portion of their range discussed here. As a result we repeat that the findings here reported do not necessarily indicate which species are most susceptible to trap losses but merely indicate the status of each species in the kill.

All figures reported in this portion of the report are actual reported figures and not computed estimates.

Again the mallard was the most common species taken in rat traps. Six hundred and sixty or 57% of all waterfowl trapped were mallards. This is a significant reduction however from last year when mallards comprised 69% of the kill. As was found last year the green-winged teal and lesser scaup ranked second and third in numbers taken in traps. There is a possibility of incorrect identification of the latter species. As it is believed that the ring-necked duck, a very similar looking species, is much more common than the lesser scaup in the area here discussed. This year when interviewing the trappers we will take specimens of both species to show the trappers.

An unusual species to be reported in rat traps for the Patricias is the shoveler. Two were reported trapped, one from Pikangikum and the other from Island-Red Sucker band area.

Twelve different species were reported trapped in the area here discussed.

Distribution of Waterfowl

To determine the validity of this type of survey as an indicator of waterfowl densities in different band areas, several years of data must be gathered and compared. For this reason diagrams I and II are constructed again in a similar manner to last year.

That is, the index of rats trapped per waterfowl is used as a criterion of waterfowl densities. Densities are recorded as high (1-20 rats per bird) medium (21-50 rats per bird) and low 51 or more rats per bird.

Comparison with last years maps shows differences in the density of waterfowl in many band areas. Five band areas had similar classifications to the 1957-58, four areas had a density one group higher than in 57-58, three areas had a density one group lower and one area had a density two groups lower than in the previous year.

Summary

1. A "Waterfowl caught in rat trap survey" was again conducted in Patricia Central and Patricia West districts for the 1958-59 season.
2. Six hundred and ninety-four or 83% of all the trappers in the Patricias were interviewed.
3. One thousand, one hundred and fifty-nine waterfowl were reported trapped and an estimated 1834 were believed to have been trapped. This was an increase of 25% on the rat trap losses from the 1957-58 season.

4. It is surmised that the loss of 1834 ducks from the spring population resulted in a loss of approximately 3300 ducks in the fall migration. This loss is still not considered too important, however, the potential importance of losses even as small as these is realized when thinking of the future.
5. Fifty-seven percent of all waterfowl caught in rat traps were mallards.
6. Twelve different species including two shovelers were reported taken in traps.
7. There was very little change in distribution of waterfowl densities as calculated from the waterfowl lost in muskrat trap questionnaires.
8. It is believed that this type of survey should be conducted for at least one or two more years.

Acknowledgments

The bulk of the data here reported was collected by Conservation Officers, E. H. Stone, D. Sayers, C. Milko, R. Toews, C. Currie and by the author. Conservation Officer J. Lessard assisted in compiling the statistics.

TABLE I - WATERFOWL TRAPPED IN MUSKRAT TRAP STATISTICS, 1959

BAND AREA	(1) # OF TRAPPERS INTER- VIEWED	(2) # OF RATS TRAPPED BY (1)	(3) TOTAL # OF RATS TRAPPED BY BAND	(4) RATS TRAPPED PER TRAPPER INTER- VIEWED 2/1	(5) WATER- FOWL REPORTED TRAPPED	(6) RATS TRAPPED PER WATER- FOWL	(7) EST'D # OF WATER- FOWL TRAPPED	CHANGE 1958
<u>PATRICIA CENTRAL</u>								
BIG TROUT	47	1599	1702	34	46	34	49	+ 13
FORT SEVERN	28	769	776	27	68	11	69	+ 39
FORT HOPE	23	587	643	25	12	49	13	- 1
LANSOWNE	96	3735	3851	36	119	31	124	- 60
BIG BEAVERHOUSE	41	1558	1823	38	55	28	65	+ 45
BEARSKIN	41	1346	1162	33	30	45	33	- 12
KASABONICA	30	754	803	25	30	25	32	- 1
PICKLE LAKE	27	635	706	23	14	45	15	-
OSNABURGH	33	539	977	16	19	28	35	- 88
SACHIGO	16	1438	1877	90	39	37	51	-
SHAMATTAWA	8	105	142	13	16	7	22	+ 18
WINISK	16	57	57	-	-	-	-	-
TOTAL	406	13122	14519	-	448	-	498	-
<u>PATRICIA WEST</u>								
LAC SEUL	32	558	1083	17	11	50	22	+ 17
DEER LAKE)								
SANDY LAKE)	59	2674	7066	45	327	8	860	+520
NORTH SPIRIT)								
PIKANGIKUM	92	5121	6266	56	209	24	256	+ 87
ISLAND-RED SUCKER	63	3118	3695	50	123	25	148	- 70
ROUND LAKE	42	2695	3308	64	41	66	50	-120
P. W. TOTAL	288	14166	21418	-	711	-	1336	-
GRAND TOTAL	694	27288	35937	-	1159	-	1834	-

TABLE 11 - WATERFOWL SPECIES CAUGHT IN MUSKRAT TRAPS, 1959

BAND AREA	MALL- ARD	PIN- TAIL	G.W. TEAL	B.W. TEAL	BLACK	BALD- PATE	AM. GOL- DEN EYE	SCAUP	BUFFLE HEAD	AMER. MERG.	CAN. GOOSE	RICHARD GOOSE	UNID.	SHOVE- LER
PATRICIA CENTRAL														
BIG TROUT	39	2	2	1	1	-	-	2	-	-	-	-	-	-
FORT SEVERN	16	28	6	10	2	3	-	1	-	-	2	-	-	-
FORT HOPE	5	-	1	-	3	-	1	2	-	-	-	-	-	-
LANDSLOWNE	80	2	17	-	4	1	-	13	-	2	-	-	-	-
BEARSKIN	17	-	6	-	1	1	-	2	3	-	-	-	-	-
BIG BEAVERHOUSE	29	1	11	3	1	2	-	2	2	-	-	-	4	-
KASABONICA	20	2	-	-	2	1	-	1	-	1	3	-	-	-
PICKLE LAKE	7	2	3	-	1	-	-	-	-	-	-	1	-	-
OSNABURGH	18	-	-	-	-	-	-	-	-	1	-	-	-	-
SACHIGO	19	-	12	-	-	-	-	4	4	-	-	-	-	-
SHAMATTAWA	6	4	3	-	3	-	-	-	-	-	-	-	-	-
TOTAL	256	41	61	13	18	8	1	27	9	4	5	1	4	T-448
P.C. % OF TOTAL														
PATRICIA WEST														
LAC SEUL	8	1	1	-	-	-	-	1	-	-	-	-	-	-
DEER LAKE)														
SANDY LAKE)	162	4	67	11	4	6	27	17	4	1	-	-	24	-
NORTH SPIRIT)														
PIKANGIKUM	144	-	18	6	2	-	2	9	7	1	-	-	19	1
ISLAND-RED	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUCKER	64	10	19	6	-	2	7	13	1	-	-	-	-	1
ROUND LAKE	26	1	6	-	-	-	-	3	-	1	-	-	4	-
TOTAL	404	16	111	23	6	8	36	43	12	3	-	-	47	2
P.W. % OF TOTAL														
(711)														
GRAND TOTAL	660	57	172	36	24	16	37	60	21	7	5	1	51	2
GRAND TOTAL 1958	764	20	72	6	3	2	46	63	12	5	7	-	97	-
% CHANGE	-12.5	+185	+139	+500	+700	+800	-19.5	-4.8	+75	+40	-28.6	-	-50	-

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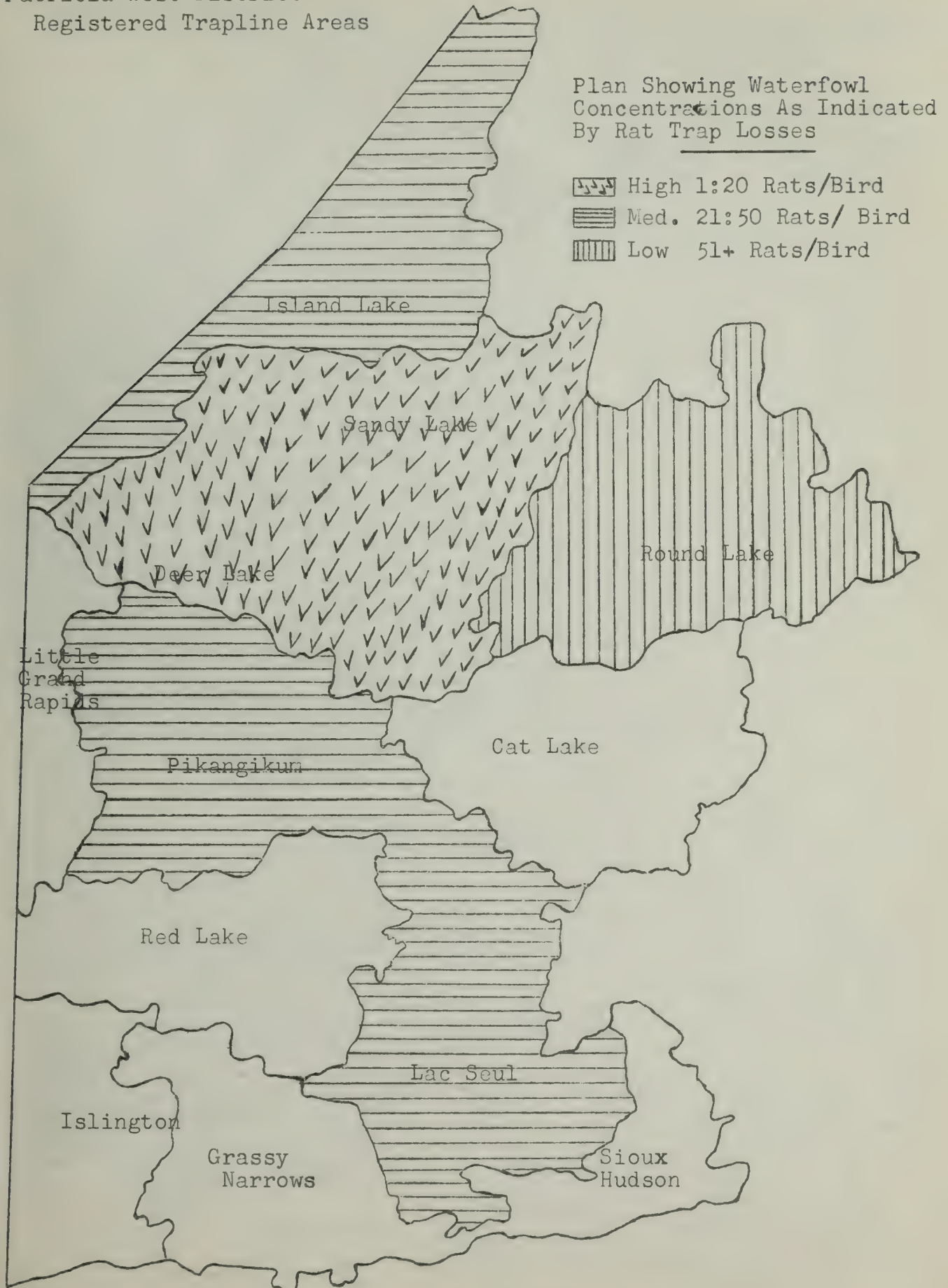
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Patricia West District
Registered Trapline Areas



Registered Trapline Areas

Plan Showing Waterfowl
Concentrations As Indicated
By Rat Trap Losses

-  High 1:20 Rats/Bird
-  Med. 21:50 Rats/Bird
-  Low 51- Rats/Bird



THE PURPOSE AND MEANING OF ENFORCEMENT *

by
E. L. Skuce

Abstract

The writer points out that enforcement is not merely the apprehending of someone who disobeys legislation intended to further a wildlife management programme but the process of encouraging people to carry out conservation plans and policies for the benefit of all. In order to teach people the moral attractiveness, virtues and innate benefits of the law the following definite plan of action was suggested:

1. Through research it must be assured that the programmes are wise and in the best interest of conservation.
2. We must be sure that the vast majority of the people understand the reasons why the laws and regulations have been made.
3. We must have educational programmes to keep the people informed of the progress being made and the benefits being enjoyed because of the laws and regulations in effect.
4. We must place before Justice persons who distrust the plan and endeavor to have the violators understand fully the necessity for the law.

Enforcement of conservation legislation means much more than the processes of justice after the law has been broken. It includes a responsibility of the scientists, administrators, and all officers to develop an atmosphere of persuasion to obey. When we begin manipulations of the populations of animals, plants, soil, and water for the best interest of man, rules and regulations usually are necessary.

As enforcement officers we are required to assure that these measures are carried out, and in my opinion this is what should be termed enforcement: the carrying out of conservation programmes.

In the conservation of our natural resources there are many different obstacles but one which seems to bother us perhaps more than any other is the obstacle of people who have no regard for the regulations. These are the people who have not yet been convinced that adherence to the rules will benefit everyone.

* Presented at the Northeast Wildlife Conference, Montreal, January 4-7, 1958.

This hindrance to our real job of managing a resource is one which we have been dealing with for a number of years. Some progress has been made toward cutting it down to a level at which at least the people who break the regulations do not change the results of our plans significantly. I suppose we might look upon this as a very worthwhile accomplishment and I wish that we could say this about all the obstacles that we encounter in wildlife management.

However, with the increasing numbers of people seeking recreation through hunting and fishing, with the vast industries which are developing through the use of these natural resources, and with the many land uses which compete with wildlife, we find that more manipulation, more control, and more conservation measures are necessary. As a result, our programme of enforcement requires sincere study and research to keep up with programmes of management.

In my opinion enforcement is not merely the apprehending of someone who disobeys legislation intended to further a wildlife management programme. I look upon it as the process of encouraging people to carry out conservation plans and policies for the benefit of all. Programmes of conservation cannot be fulfilled merely by making regulations. Granted, good laws and regulations come about only after long and earnest research and, at least in theory, after they have been requested by the general population, since they are passed through regular democratic processes of law-making. In practise many laws have little to do with programmes of conservation until their supporting regulations are made. As contained in the statutes of a Province or State, the game and fisheries laws merely provide statements of penalties for non-compliance; unfortunately they do not inform us of the potential rewards for obedience to the legislation.

There is also the additional thought that plans and policies as well as legislation are more or less useless unless they are known to all who may be concerned with them.

A regulation may read: "No person shall kill an eagle, and any person who violates this rule shall be penalized not less than Ten Dollars." If the officer does not know why the eagle shall not be killed, he is in a poor position to enforce it intelligently. Similarly the offender, even if he knows the law, is less likely to obey it if he does not know the reason why it was put into effect. If these two opposing points of view could be aligned, we would not hear as frequently as we do now, the statement from a game and fisheries enforcement officer; "I don't make the law, I only enforce it." In this example it might well be that the offender would be fined for breaking the legislation and the officer could be said to have done his part, but is this truly the most desirable course of events? An officer should never be in a position that he only looks for violators and he should realize that he will never bring about the cooperation of people simply by assisting in imposing penalties.

We often read news releases advising the people to obey the laws and avoid the fines. The press emphasizes the penalties that a law violator faces with headlines such as, "Angler Fined \$100.00," followed with the story of his fishing gear being seized and all the trouble he is in, finally stating; "It is said that he took 100 undersized speckled trout." This news tends to create a sympathy for the poor fellow who was unfortunate enough to be caught. It does little to increase our knowledge of the actual damage done by the taking of 100 undersized trout. A headline "One Hundred Undersized Trout Killed, Conservation Programme Receives Setback," followed with a story about fish propagation and the remark, "It is said the trout were all killed by one angler" would do more to assist the conservation plan.

A child may be told not to pull the cat's tail because of the danger of being scratched. Very likely the cat's tail will be pulled, however, and possibly the child will be scratched. The child may be wiser, but more likely the cat's tail will be pulled again in a more abrupt manner in such a way as to avoid the scratch with the result that the cat will be hurt even more than previously. If the child had been taught why it should refrain from hurting the kitten, I am sure there would have been better results.

If we are to teach people in our area the necessity for management and the benefits of assisting in conservation programmes, we must carefully teach the various regulations and more particularly the reasons why they are necessary.

We should not endeavor to place the whole responsibility on a person who pleads he did not know the law by telling him ignorance of the law is no excuse. A plea of ignorance should be a signal to us that our teaching has not reached everyone.

The Manager who insists on discipline according to the book and refuses to hear other views, provokes dissention. We must teach the moral attractiveness, the virtues, the innate benefits of the law. This can only be accomplished by a definite plan of action.

First.- We must assure through research that the programmes are wise and in the best interest of conservation.

Second - In order to eliminate the desire to disobey after the laws and regulations have been made, we must be sure that the vast majority of the people understand the reasons why they were established.

Enforcement must commence with these two foremost parts of our conservation programme. Enforcement must be carefully mixed with all other ingredients of the whole programme. It cannot be merely a clause or a postscript added to the management plans, like a penalty clause attached to a regulation.

Third - We must have education programmes to keep the people informed of the progress being made and the benefits that are being enjoyed because of the laws and regulations in effect.

Managers must continue research and the programmes and policies must stand the tests of use. The removal of outdated measures is very important. For example, we might provide a quota of ten beaver to a trapper and when the population of beaver increases to hundreds on his trapline, it may no longer be reasonable to have such a regulation. In such a case it should be removed promptly. Again, it may be wise to provide some type of game sanctuary but if the area eventually falls within the limits of a city, the days of the sanctuary's usefulness will have been outlived and the regulations concerning it should be removed. Too often our laws are not up-to-date with the progress of our research programme. This certainly does not encourage good enforcement. The people concerned and the officers who must enforce the laws lose respect for the legislation.

Fourth - We must place before Justice persons who disrupt the plan, endeavoring to have them realize the reason for the law, and if possible we should endeavor to win their respect to such a degree that they will come back to assist with the conservation plan.

We cannot suggest any reduction in the necessity of applying penalties at certain times. This is still, and probably always will be, an important phase of enforcement and therefore of conservation measures. However, we must try to reduce the numbers of people who disobey because of lack of interest or lack of understanding.

For example, commercial fishing regulations may provide that only a certain size of mesh of gill nets may be used. This regulation will doubtless have been made in order that fish of certain sizes and year classes would not be taken in the year's operation, so that the species will survive and propagate. The operator who has been advised only of the penalty for non-compliance may decide to take the chance and break the law. In doing so he may well upset the programme and damage the entire industry. In such a case there is every necessity of applying suitable penalties to the offender. On the other hand, with proper understanding the innate benefits of the regulations, many people would take great pains not to break the rules which, in the final analysis, have been enacted for their own benefit.

Penalty must not be the first application in our enforcement programme; neither shall it be the last. We should continue our efforts to win the cooperation of the violators by having them understand fully the necessity for the rule.

The fifth step in our plan of action in enforcement would be a review of the four stages just outlined:

1. Was the research good?
2. Were the people properly informed?
3. Did we advise the people of the progress made as well as the difficulties encountered?
4. Was justice properly administered?

These reviews will assist in deciding where our efforts should be increased or decreased. Too much emphasis on one sector at the expense of the other may be dangerous. Reviews will show up the short-comings and the weaknesses in our plans and regulations and we shall be in a better position to find support for the conservation measures in effect, if they are sound.

So, with all of this, it is evident that enforcement must become something of a science. Our plan of action and teachings must be reflected in the behaviour and sportsmanship of the people toward conservation. Their actions and attitudes will show whether they have gained full knowledge of the need of conservation plans, or whether the laws in conservation of fish and wildlife are only considered wise when an officer is near and mean little when his back is turned.

In this paper there were endeavors to provide definitions for enforcement of conservation measures:

1. Insuring the fulfillment of conservation plans.
2. Bringing about a will of the people to carry out conservation plans.
3. Management plus support implies enforcement ($M + S \rightarrow E$.)

Of course, management minus support implies poor enforcement ($M - S \rightarrow P.E.$).

Another definition of enforcement I have heard was "Compelling obedience of the rules." This definition has something that seems unsuitable for enforcement of conservation measures. It is difficult to say we will compel. However, compel could be said to mean drive, therefore, if we wish we could have the fourth definition:

4. Organized drive toward obedience of the rule.

It has been emphasized that the drive toward obedience must include a programme of persuasion by education. Education to bring about good enforcement must commence with our research and the people must be carried along in every stage of our plan of action. Conservation will then be the people's business.

Thus, in making our plans for enforcement it is necessary to consider the fact that compelling obedience to the rules is incomplete and temporary; whereas obedience developed as an outgrowth of the natural moral tendency to do the right thing is complete and lasting - enforcement by will rather than by compulsion.

LAKE TROUT SPAWNING SURVEY
HOLLOW LAKE, PARRY SOUND DISTRICT, 1959

by
Wm. Ellerington and C. A. Rettie

Abstract

In order to study the effects of water draw-downs during the fall and winter on lake trout reproduction, a survey was made in Hollow (Kawagama) Lake, Haliburton County. The study showed that (1) lake trout commenced their spawning run on October 22 (2) spawning occurred in depths of from six inches to a least four feet, (3) spawn was heaviest between two and three feet, (4) any draw-down of Hollow Lake water after the spawning date would have an adverse effect on lake trout reproduction, (5) the present agreement made with the Hydro-Electric Commission "To endeavour to hold the water from October 15th to March 15th as nearly stable as possible" should be very beneficial to lake trout reproduction.

Hollow or Kawagama Lake is located in McClintock, Sherborne, Livingstone and Havelock Townships in the County of Haliburton. It covers an area of approximately 7,765 acres and contains several large islands. The shoreline and substratum varies from sand to gravel, boulders and rock. The maximum depth recorded is 216 feet in depth. The outlet is the Hollow River draining into the Lake of Bays near Dorset. This outlet is controlled by a dam under the supervision of the Ontario Hydro Commission.

In the past this lake has supported a good lake trout sport fishery but from recent general reports from sportsmen the supply would appear to be dwindling and a growing concern has been expressed over the effects of water drawn down during the fall and winter on lake trout reproduction. Therefore a study was made in an effort to determine at what depths the spawning occurs so that some definite information would be available and remedial steps could be taken. At the same time successful negotiations were carried out with the Hydro Commission and an agreement was reached whereby the water level will be stabilized during the fall and winter periods.

Several of the better spawning areas were kept under surveillance by Conservation Officer Wm. Ellerington as the spawning season approached and on October 14th, the first observations of lake trout were made but only of a few fish.

Observations on the night of October 17th revealed no fish on the spawning areas but 16 lake trout were taken in an experimental net set in 20 feet of water in front of the spawning area. Of these 16 fish, 13 were male and near ripe, one male appeared spent, one female was nearly ripe and one immature female contained spawn the size of pinheads. Dredging was tried experimentally with an Eckman dredge but was not very successful on the rocky bottom. Some bottom samples were obtained but contained no spawn. The spawning run was apparently just beginning.

On October 18, in an effort to increase our knowledge of the spawning areas two lifelong residents of this lake were contacted and they willingly marked on our map all spawning beds known to them. Seventeen areas were marked as spawning grounds and when checked on October 19th. appeared to be potentially good spawning beds. Observations during the same evening revealed no fish.

No fish were observed again until October 22, when a few were sighted although several attempts were made to make observations. On many occasions the lake was choppy and fish may have been missed because of difficulty in handling the boat and wave action. It would appear that after an initial beginning on October 14th. the lake trout had returned to deep water to commence their spawning run again on October 22.

From this date on fish were observed on several nights in varying depths of water from six inches to 11 feet. A water box was now used as an aid to underwater observations. On November 1st, an experimental gill net set for two hours at dusk in 10'-15' water in front of a spawning bed contained 11 lake trout. Ten of these fish were males and were ripe. The lone female taken was spent, suggesting that spawning was now taking place. Surface temperature was 49°.

November 2nd. was taken up with a deer aging course at the Ranger School and Hollow Lake was too rough during the evening to make observations. On November 3rd, four areas were located where the rubble appeared to have been cleaned by spawning action. On these areas spawn could be readily washed out of the rubble by stirring with a paddle. An ordinary tinsmith's bilge pump was tried and successfully sucked up spawn from 6" to 4 feet depth. The bottom of the pump was placed on the rubble and a few strokes of the plunger was sufficient to bring up several (3-50) eggs from almost any location. These were collected by running the discharge from the pump over a screen. Lacking better equipment, perhaps a longer intake hose, we were not able to check depths greater than four feet.

After this date because of the approaching deer season and pressure of other work this survey was discontinued, except for observations of the water levels by Ellerington.

Conclusions

1. There are numerous good spawning areas for lake trout in Hollow Lake.
2. Although actual sightings of lake trout were few it must be remembered that the weather generally was very bad making observations difficult. We believe there is still a good spawning population of lake trout left in Hollow Lake.
3. The Lake level this October was 7.5 feet or approximately five feet below high water mark. Since then the level was increased to 11 feet but is again being lowered.
4. Spawning occurred this year as evident by the presence of spawn in depths from 6" to at least four feet. Some spawn was located almost at shore near the water surface level but may have been washed up by wave action. Spawn was heaviest between two and three feet. A few dead eggs were located almost at the surface, near the shore.
5. Any draw-down of the Hollow Lake water after the spawning date would have an adverse effect on lake trout reproduction. Some spawn will undoubtedly perish from ice but a draw-down of several feet as has been experienced in some years would have drastic effects on the beds found and checked.
6. The present agreement made by the Hydro-Electric Power Commission "to endeavour to hold the water from October 15th to March 15th as nearly stable as possible" should be very beneficial to lake trout reproduction.
7. The area of some potential spawning ground would be increased if the lake was maintained at a higher level than was the situation this fall. Such considerations would, however, involve so many further complications such as dam-height, shoreline clearing, cottagers' rights, etc., as to render them highly impractical if not impossible at this time.
8. We would recommend that the present re-stocking policy for this lake be continued as well as the present water level agreement. The spawn investigation should continue at least one more year and the creel census projects should be expanded.

TABLE I - Fall and Winter Water Levels of Hollow Lake, 1953-1950*

	<u>Oct. 15</u>	<u>Nov. 15</u>	<u>Dec. 15</u>	<u>Jan. 15</u>	<u>Feb. 15</u>	<u>Mar. 15</u>
1953/54	5.80	4.80	5.50	6.30	6.90	7.70
1954/55	12.55	10.05	10.65	10.75	7.30	5.30
1955/56	7.20	9.00	9.80	9.50	6.80	4.70
1956/57	10.35	9.60	10.10	10.40	9.00	6.00
1957/58	8.80	10.00	12.10	10.90	6.30	4.50
1958/59	9.75	10.65	9.30	7.85	7.00	4.90
1959/60	7.45	10.40	10.70	10.4	-	-

* Water levels shown are those taken closest to the 15th.
Water levels recorded by H.E.P.C.

TABLE II - Summary of Lake Trout Age Classes, 1959^{*},

<u>Experimental Net Catch</u>			
<u>Age Group</u>	<u>No. of Fish.</u>	<u>Average Total Length (ins.)</u>	<u>Range</u>
VI	20	16.5	(15.4-18.5)
VII	6	19.1	(18.0-19.6)
VIII	1	22.0	-

^{*} 27 lake trout captured experimentally Oct. 17th, and Nov. 1/59 using two gill nets ($2\frac{1}{2}$ " & $4\frac{1}{2}$ " mesh).

TRAP-NET PROGRAM ON CROW (KAKAGI) LAKE,
KENORA DISTRICT, 1959

by
C. F. Schenk

Abstract

A project was organized to test the feasibility of trap-net fishing in cold water lakes as a means of commercial exploitation. If the trap-nets would function satisfactorily, commercial species could be harvested while undersized and game fish could be returned to the water. Experimental nets were operated from May 14 to July 9, 1959 in Crow (Kakagi) Lake, Kenora District. A conclusive lack of success was the unfortunate result achieved with trap-nets in this particular lake. A total of 384 fish, of which 271 were whitefish and 41 were lake trout were caught in 157 trap-net days of fishing. The placement of control gill-nets near the trap-net locations indicated that the trap-nets were not taking fish proportional to fish numbers present in the areas being investigated. No explanation presented itself to explain the poor results achieved with the traps. Recommendations regarding further experimental work with trap-nets are offered.

Acknowledgment

The daily records kept by Mr. G. Clifford, who worked on the project, made this report possible. His assistance in completing the map showing the net locations is also acknowledged and was greatly appreciated.

Introduction

The success of the trap-net project on Lake of the Woods in the summer of 1958 prompted the Kenora District to request a similar undertaking in a cold water lake the following summer.

Several sizeable cold water lakes are present in the Kenora District and it is expected that biological surveys which are to be completed as soon as possible will indicate that some of these lakes support substantial whitefish populations. On the other hand it is also to be expected that certain of these bodies of water will contain worthwhile populations of game species. There could be, therefore, some difficulty in effecting a complete and publicly accepted utilization of all species, if gill net fishing is to be implemented as the means of commercial exploitation.

If trap nets would function satisfactorily in these lakes, commercial species could be harvested, while undersized and game fish could be returned to the water. Furthermore, trap nets might operate more efficiently than gill nets, thus enabling an operator to realize a particular quota in less time. As well, trap nets do not have to be lifted every day and fish taken by this method, if properly iced, command a better price since they arrive at market in better condition.

Crow Lake was suggested as a promising lake for the project. It has been licensed to commercial fishing since 1954 and it was felt that this would enable us to compare trap-net results with previous gill-net operations. A project was thereby organized under the supervision of Mr. MacGillivray of Head Office to experiment with trap nets in Crow Lake. The experimental nets were operated from May 14 to July 9.

Crow Lake

Physical Properties

Crow Lake is situated east of and adjoining Highway 70, about eight miles north of the village of Nestor Falls. It covers an area of 37.8 square miles and drains north-west through Cedartree, Caviar and Dogpaw Lakes and thence into Regina Bay, which in connected to Whitefish Bay, part of Lake of the Woods.

The lake is extremely irregular in outline and is traversed by a series of island chains which run in a SW-NE direction. There are many small bays which are sheltered by steep rock cliffs.

Water depths in the lake range up to 185 feet. Water temperatures taken at a location where the water was 88 feet in depth on June 10, 1959, ranged from a surface temperature of 61°F to a bottom temperature of 44°F. At the spot where these temperatures were taken, a thermocline existed between 20 and 30 feet, with a temperature change of 10° occurring within this stratum.

The water in this lake is very clear and relatively infertile, judging by the lack of suspended organic matter.

Biological Properties

Crow Lake is known to contain whitefish, lake trout, ling, common white suckers, smallmouth bass, maskinonge, pike, small ciscos and a few pickerel.

On the basis of lake surveys conducted in 1954, substantial whitefish and lake trout populations were considered to be present (Fraser, 1954). During the last four-year period, the average annual commercial catch of whitefish on Crow Lake has approximated 30,000 pounds. An annual quota of 4,000 pounds of lake trout has constantly been in effect since the commencement of commercial fishing to protect this game fish resource from excessive commercial exploitation.

Methods and Equipment

Three trap nets were used during the experiment, all of them being sixteen foot downhaul traps. The twine of one net was constructed of cotton, while the other two nets were made of nylon twine.

The sides of the cribs in all three nets were made of $2\frac{1}{2}$ " mesh and the leads were constructed of 6" mesh. The length of lead used varied with the set.

Information provided by the single commercial fisherman on Crow Lake, who assisted in this project, was used extensively in selecting sites for the various trap-net sets. This fisherman was not fishing commercially with gill nets throughout the course of the experiment but, commencing on June 4th, he made experimental sets using small quantities of gill net near the trap-net locations for the purpose of evaluating the results being achieved with the traps.

The cotton net (Net A) and one of the nylon nets (Net B) were moved twice during the project and the remaining nylon net was moved once.

The locations of the various sets are indicated on the map on page 58.

All lake trout caught during the experiment were fin-clipped and returned to the water. The right pectoral fin was clipped on trout taken in trap A, the left pectoral on those taken in trap B, and the right pelvic on those captured in trap C. This was done so that it would be possible to record the re-entry of fish into the traps.

All other fish taken of marketable size were retained and sold, the profits realized being used to offset the expense of the project.

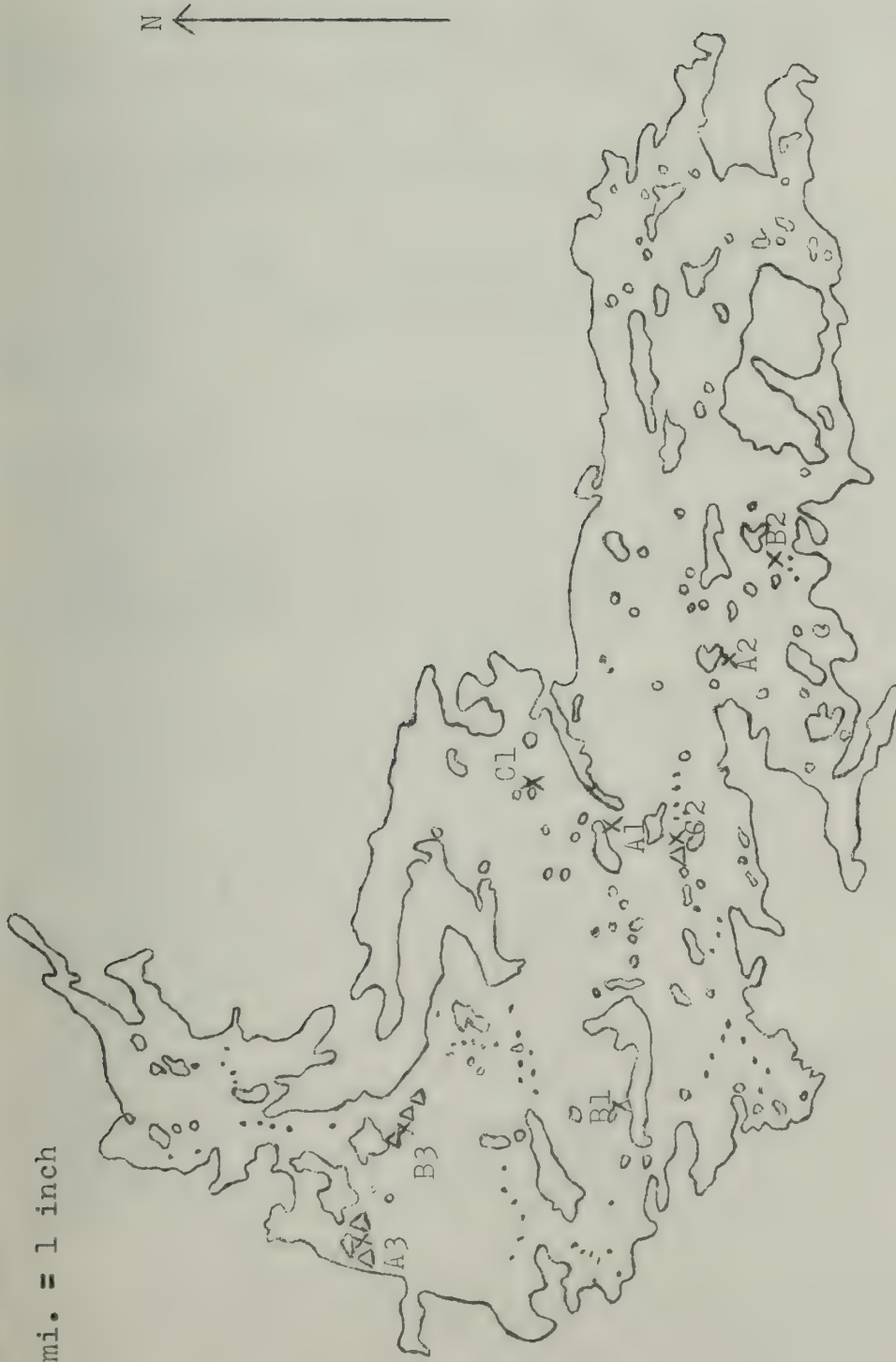
Camp operators along the lake were requested to be on the watch for marked trout. A comprehensive creel census was undertaken throughout the month of June in the event that information concerning movements of the marked trout, and an estimate of the rate of exploitation that the lake trout population received through angling, might be gained. Basic management information concerning angling success was also to be gained through the implementation of this census work.

Results

Table I indicates the extremely disappointing results that were achieved with trap nets in this particular lake.

CROW LAKE

2 mi. = 1 inch



Δ Trap-net location.

X Location of gill-net sets.

The trap-net crew are to be commended on their dedication to their task in the face of repeatedly discouraging returns. The traps were checked time and again in the hope that some explanation of the lack of success might be forthcoming. Also, the nets were moved several times in order that various water depths would be tested; sets were made as deeply as could possibly be undertaken with this type of net (56 feet at the crib).

The eight trap-net sets collectively fished a total of 156 days. Two hundred and seventy-one whitefish were caught throughout this period, not including those which gilled in the trap-net twine, of which there were an additional 142.

Forty-one lake trout were caught in the traps, while an additional seventeen were gilled in the twine.

Twenty ling, 34 white suckers and four maskinonge were also taken, while one set, namely A1, was successful in capturing 14 smallmouth bass, four northern pike and one maskinonge were gilled in the traps in addition to the whitefish and lake trout just mentioned.

Table II indicates the catches made in the gill nets which were used as checks against the traps. The gill-net sets, each consisting of one hundred yards of $4\frac{1}{2}$ " mesh, set in close proximity to the trap nets, fished a total of 54 days. The amount of gill net used was purposely kept to a minimum in order that there would be little possibility of these control operations affecting the trap-net catches. The nets were set in such a manner that direct fish movements towards the trap-net leads would not be impeded.

The number of whitefish caught in the 32 gill-net sets was 224; 119 lake trout were also caught, along with 48 white suckers, five smallmouth bass and two ling. It is difficult to estimate what gill-net / trap-net ratio should be considered reasonable in a comparative evaluation of gill-net and trap-net performances. However, considering catch / effort statistics from other sources, the cost of purchasing equipment necessary for each type of fishing and the handling ease in working with each of these two types of gear, it is certain that considerably more than one hundred yards of gill net should be regarded as the counterpart of one trap-net.

The gill-net sets in the immediate vicinities of the four trap-net sets A3, B3, C1 and C2 certainly indicated that whitefish and trout were available in greater numbers than the results achieved with the traps would suggest. The 100-yard sets near B3, C1 and C2 in each case fished only about half as many days as the adjacent traps, but caught considerably more whitefish and lake trout at each of these locations (see tables 1 and 2).

Considering a unit of effort as being 100 yards of gill net fishing for a 24-hour period, the collective success of all of the control gill nets throughout the survey is represented by an average of 4.15 whitefish per unit of effort and 2.13 lake trout per

unit of effort. The average trap net success, employing a unit of effort as being one trap net fishing for a 24-hour period, is 1.73 whitefish per u.o.e. and .26 lake trout per u.o.e.. In establishing this comparison, it is not intended to suppose that any degree of equality in the potential fishing efforts of these respective units of gear exists. The comparison is made to emphasize that some unknown factor was imminent which limited the success of the trap net operations.

None of the trout which were fin-clipped re-entered the trap nets, nor were any of these marked fish caught in the gill nets used during the summer. No reductions in the lake trout catches in either of the two types of gear were therefore necessary.

Creel Census Results

Since only 41 lake trout were marked during the entire project, it is understandable that little could be learned concerning the angling exploitation rate. During the early part of June each year, before the trout descend to deeper water, the angling pressure is reasonably heavy on Crow Lake (by Kenora District standards) and it was hoped that enough fish would be marked during May to allow some estimates of population size and exploitation rate to be made from creel census work carried out during June.

However, the creel census undertaken is valuable as a measurement of the quality of angling in Crow Lake; it also illustrates the change of emphasis from lake trout during the spring and early summer to other species during the warmer months, when trolling is the only practical method by which lake trout can be taken. There is little deep-water trolling done in any part of the Kenora District as is substantiated by the creel census presently under discussion.

In order to properly assess lake trout availability to anglers, it is perhaps advisable to consider only the period preceding June 10, before any fishing effort was directed towards the catching of smallmouth bass. June 10 was the opening date for this latter species in the Kenora District.

The results of the census with respect to lake trout are quite surprising! In the period between May 30 and June 9, both dates inclusive, 177 anglers fished a total of 1,240 hours and caught only 116 lake trout. The average time required to catch one trout, therefore, was 10.7 hours. Five pounds was the average weight of the trout caught.

During the period from June 10 to June 21, 193 anglers fished a total 1,112 hours and caught 610 bass, 35 trout, 15 northern pike and two maskinonge. These combined efforts indicate a reward of approximately .5 fish per angling hour. Fifteen of the 193 fishermen were fishing for lake trout only, which means that 178 anglers fished 1,024 hours and caught 610 bass, or .6 of a bass for each hour expended. The census clearly illustrates that more emphasis was placed on bass than on trout in the latter half of June.

TABLE I - Fish Caught In Various Trap Sets

Trap Set	Date Set	Date Pulled	Total Days	No. of Lifts	Depth	White-fish	Lake Trout	Maskinonge	N. Pike	White Sucker	Ling	S. M. Bass
A	1 May 13	June 4	22	12	23 ft.	109	18	1	-	23	1	14
	2 June 4	June 15	11	5	24 ft.	13	3	2	-	6	1	-
	3 June 16	July 8	22	11	36 ft.	81	8	-	-	1	2	-
B	1 May 14	June 1	18	8	23 ft.	21	5	-	-	1	14	-
	2 June 2	June 9	7	4	20 ft.	6	1	-	-	-	-	-
	3 June 9	July 9	30	15	42 ft.	38	2	-	-	3	2	-
C	1 May 22	June 23	32	14	40 ft.	1	1	-	-	-	-	-
	2 June 23	July 8	15	8	56 ft.	2	3	1	-	-	-	-
TOTALS			157	77		271	41	4		34	20	14

TABLE II - Fish Caught In Gill-net Sets

Location	Period	Total Days	No. of Sets	Average Depth	White-fish	Lake Trout	White-Suckers	Ling	S. M. Bass
Near A3	June 9 - July 2	13	9	45 ft.	48	33	-	1	-
Near B3	June 19 - July 9	18	10	45 ft.	73	39	29	1	5
Near C1	June 3 - June 19	16	10	40 ft.	72	35	19	-	-
Near C2	June 24 - July 8	7	3	55 ft.	31	12	-	-	-
TOTALS		54	32		224	119	48	2	5

All gill-net sets were 100 yards of 4½" mesh.

Synopsis

A conclusive lack of success was the unfortunate result achieved with trap nets in Crow Lake during the summer of 1959. A total of 384 fish, of which 271 were whitefish and 41 were lake trout were caught in 157 trap-net days of fishing.

The placement of control gill nets near the trap-net locations indicated that the trap nets were not taking fish proportional to fish numbers present in the areas being investigated.

No explanation presented itself to explain the poor results achieved with the traps. The extreme clarity of the lake may have had something to do with the reluctance of fish to enter the traps, or, perhaps the whitefish and lake trout populations are limited enough to render returns insufficient when the fish are ranging widely during the summer period. Such theories are pure speculation and contribute little to the purpose of this report.

Although the original intent of the creel census undertaken during June was nullified in view of the small number of fish marked, it is extremely enlightening to know that nearly 11 hours of fishing per lake trout are required on Crow Lake.

Whether this latter information reflects the instability of the Crow Lake trout population should be determined, if possible, through one or more tag recovery projects; the presence of a commercial fishery on the lake and the accessibility and importance of the lake to local and non-resident anglers would suggest an imperative need for such a study.

Recommendations

1. All future applications for trap-net licences in the Kenora District should be rejected until the efforts and returns of presently licensed trap-net fishermen can be properly evaluated for at least a three-year period.
2. No trap-net licence should be granted for any cold water lake in the Kenora District unless further experimental work with this gear suggests that its use is economically sound.
3. The need for having a publicly acceptable type of commercial fishing in important sports fishing waters is great. On this account, it is recommended that further experimental work be carried out with trap-nets to provide additional information concerning the value of this type of gear. A cold water lake which lacks the clarity of Crow Lake might present a set of conditions which would yield more encouraging returns.

4. A trout marking programme, preferably with some sort of readily observable tags, should be carried out on Crow Lake to provide an estimate of the exploitation rate of the lake trout population. This should be attempted to determine whether the present poor angling is related to the size and structure of the lake trout population or some other variable, such as the fish food crop.

Literature Cited

- Fraser, J.
1953. A biological survey of Crow (Kakagi) Lake. Unpublished file report, Kenora District.
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